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Psychological Health of Retirees in Rural Scotland

Anna Graham



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The University of Edinburgh
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Table of Contents

Acknowledgements.....	3
Table of Contents	4
List of Tables and Figures.....	6
1.0 Abstract.....	7
2.0 Systematic Review.....	8
2.1 Abstract.....	9
2.2 Introduction.....	10
2.3 Method.....	17
2.4 Results.....	20
2.5 Discussion.....	31
2.6 Conclusion	43
2.7 References.....	44
3.0 Bridging Chapter	55
4.0 Hypotheses.....	56
5.0 Method	57
5.1 Design and Procedure	57
2.2 Participants.....	61
2.3 Measures	62
2.4 Ethical Approval	74
2.5 Power Calculation.....	74
2.6 Missing data.....	76
6.0 Journal Article	78
6.1 Abstract.....	79
6.2 Introduction.....	80
6.3 Method.....	82

6.4 Results.....	91
6.5 Discussion.....	97
6.7 References.....	103
7.0 Results	108
7.1 Overview of Analysis	108
7.2 Exploratory Analysis	109
7.3 Descriptive Statistics.....	110
7.4 Hypothesis one.....	115
7.5 Hypothesis two.....	117
7.6 Hypothesis three.....	119
8.0 Discussion.....	136
8.1 Study aims.....	136
8.2 Summary of findings.....	136
8.3 Strengths and limitations.....	152
8.4 Future research.....	156
8.4 Clinical implications	157
8.5 Conclusions.....	159
References	160
Appendices.....	187

List of Tables and Figures

Figure 2.1 Flow chart of inclusion and exclusion of articles identified in the search strategy	22
Table 2.1 Validity of prospective studies of risk factors for depression among older adults according to quality criteria	26
Table 2.2 Prospective studies of risk factors for depression among older adults.....	27
Table 2.3 Findings of risk factors for depression among older adults from prospective studies	29
Figure 5.1 Flow chart outlining the sampling procedure employed by Public Health Department of NHSDG.....	60
Figure 5.2 Flow chart of recruitment process	61
Table 6.1 Characteristics of sample	84
Table 6.2 Means and standard deviations of primary outcome variables and other outcomes measures.....	91
Table 6.3 Summary of multiple regression analyses predicting psychological health.....	92
Table 7.1 Characteristics of sample	113
Table 7.2 Psychological health of relocaters versus non-relocaters.....	116
Table 7.3 Psychological health of “locals” versus “incomers”	118
Table 7.4 Correlation analysis.....	121
Table 7.5 Summary of multiple regression analyses predicting psychological health.....	122

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1.0 Abstract

Background: In order to aid effective assessment and detection of psychological health, a clear understanding of the risk factors for disturbance is required. This study was undertaken to test the hypothesis that demographic factors, health factors, social factors, attitudes to ageing, number of life events in the last year and relocation status would each significantly account for, and contribute to, the variance in psychological health.

Method: The study employed a cross-sectional design in which 1,080 individuals over the age of 55 were randomly drawn from the community health index (CHI) of a rural health board in Scotland and invited to participate in the study. One hundred and ninety-six respondents completed questionnaires assessing psychological health and a range of potential predictors.

Results: Overall, negative attitudes to ageing were the most prominent predictors of poor psychological health. Psychosocial loss was the only variable found to be a predictor of all seven outcome variables, including anxiety and depression, physical, psychological, social, and environmental quality of life, and general psychological and social functioning. Other predictors included a higher number of life events, poor social support from friends, poor self-rated health and not having a spouse/partner.

Conclusions: Attitudes to ageing appear to play a significant role in the psychological health of older adults. Promoting positive perceptions of ageing in society may potentially pay dividends in the prevention of emotional distress in later life. Psychological interventions, such as cognitive behaviour therapy (CBT), may be key to addressing negative attitudes to ageing at an individual level.

2.0 Systematic Review

A systematic review of prospective studies investigating risk factors for depression among community-dwelling older adults

Anna Graham, MA

Department of Psychological Services and Research, NHS

Dr Ken Laidlaw, PhD

Clinical Psychology, School of Health in Social Science, University of Edinburgh

Dr John Higgon, D.Clin.Psychol

Department of Psychological Services and Research, NHS

This review has been written in accordance with the author guidelines of Clinical

Psychology Review (Appendix 1)

2.1 Abstract

Objective: This review aims to determine risk factors for depression in community-dwelling older adults (aged 55 years and over) by assessing the research literature on this topic published over the last decade.

Method: PsycINFO, CINAHL Plus with Full Text, Medline with Full Text, and Psychology and Behavioural Sciences Collection were searched for potentially relevant articles published January 2001 – May 2012, using the terms “depression,” “risk factor,” and “community.” Seven studies met the inclusion criteria: original article published in English, community-dwelling participants, data provided on participants aged 55 and over, prospective design excluding depressed subjects at baseline (or controlling for baseline depression), study of at least one risk factor for depression, recognised diagnostic criteria/cut-off on a rating scale, and odds ratios reported.

Results and Discussion: The quality of studies was variable and the best quality studies pointed to diabetes, heart disease and hypertension as risk factors for depression. In addition, sleep disturbance was also identified as a risk factor, highlighting the potential benefit of prevention programmes based on psychosocial principles.

Conclusions: Risk factors identified in the current review were limited by the bias of the original researchers, many of whom assessed only a small number of potential risk factors.

Key words: depression, older adult, community, risk factor, review

2.2 Introduction

Within the developed world, the population over the age of 60 is growing at its fastest ever rate and it is projected to increase by more than 50 per cent over the next forty years, growing from 274 million in 2011 to 418 million in 2050 (UN, 2011). Within the UK, the size of the population aged 60 and above will increase by 48 per cent, from 14.1 million in 2010 to 20.9 million in 2035 (Office for National Statistics, 2011). The fastest growing segment of the population in the UK comprises individuals aged 85 years and over (Office for National Statistics, 2011). In 2010, there were 1.4 million individuals over 85 in the UK and this number is predicted to increase to 3.5 million in 2035, more than doubling in size in 25 years (Office for National Statistics, 2011).

The UK is undoubtedly experiencing a profound ageing of the population, with individuals living longer and healthier lives than previous cohorts (Laidlaw & Pachana, 2009). Indeed the pattern of health and illness is changing, with an increasing number of older adults suffering from long term health conditions (Loretto & Taylor, 2007). Furthermore, it had been suggested that chronic mental health difficulties, and depression in particular, may often go undetected in older adults (Baldwin, 2000).

Estimates for the prevalence of major depression in community dwelling older adults in the developed world range from approximately 4.0 to 5.3 per cent (Goldney, Eckert, Hawthorne, & Taylor, 2010; Hidaka et al., 2012; Mojtabai & Olfson, 2004). However, clinically significant depressive symptoms are reported to be much higher,

with estimates between 4.9 and 17.6 per cent (Beekman et al., 2001; McGuire, Strine, Allen, Anderson, & Mokdad, 2009; Wild et al., 2012; Zivin et al., 2010). Although these estimates are lower than those of adults of working age (Fiske, Wetherell, & Gatz, 2009), they nonetheless represent a significant impact upon individuals' functioning and quality of life (Travis, Lyness, Shields, King, & Cox, 2004).

One of the reasons depression may often go undetected is that it is not uncommon for health professionals working with older adults to consider depression an inevitability of old age (Cole, Christensen, Raju, & Feldman, 1997). Advancing age can be seen as a time of decreasing health, poorer mobility, loneliness and loss, in which depression is to be expected. The erroneous opinion that depression is an unavoidable consequence of ageing is also a commonly held view amongst depressed and non-depressed older adults themselves (Law, Laidlaw, & Peck, 2010). Yet this is not supported by the evidence. Research suggests that older adults experience the same levels of social satisfaction as younger adults (von Hippel, Henry, & Matovic, 2008) and are generally happier than younger adults (Blanchflower & Oswald, 2008; Yang, 2008), despite the common challenges of increasing age (Fiske et al., 2009). Furthermore, in a recently published longitudinal study of adults aged 18-94, Carstensen *et al.* (2011) reported that, rather than declining, emotional well-being improves with age.

Therefore, rather than an inevitability of old age, depression is a mental health problem that affects the minority of older adults, although subclinical levels of

depression may be more common (Judd, Schettler, & Akiskal, 2002). As at other ages, depression is a condition that affects the individual in a variety of ways: cognitively, emotionally, psychologically, physiologically and behaviourally. As such, many of the psychological therapies that have been found to be efficacious for the treatment of depressive disorders are effective with older adults (Cuijpers, van Straten, & Smit, 2006; Cuijpers, van Straten, Smit, & Andersson, 2009). In particular, cognitive behavioural therapy, interpersonal therapy and psychodynamic therapy have been found to have positive results with older adults (Pinquart, Duberstein, & Lyness, 2007; Reynolds et al., 2006; Wilson, Mottram, & Vassilas, 2008). However, even the most efficacious treatments provide only moderate effect sizes (Pinquart, Duberstein, & Lyness, 2006), a finding which is consistent with studies for adults of working age (Cuijpers et al., 2009).

Although there is strong empirical support for the efficacy of psychotherapy, and research suggests that older adults hold positive views towards seeking help from mental health services (Mackenzie, Gekoski, & Knox, 2006), this age group continues to underutilise mental health services (Bogner, De Vries, Maulik, & Unützer, 2009; Karlin, Duffy, & Gleaves, 2008; Klap, Unroe, & Unützer, 2003). Despite the low levels of older adults utilising mental health services, the growth of this demographic group means that increasing numbers of individuals will be seeking treatment over time. In addition, there are a number of national priorities within the UK, emphasising the importance of increasing access to psychological therapies for this age group (Department of Health, 2009). There is therefore a growing demand on health care providers to offer efficacious and economical mental health care to

older people. Depression prevention programmes have been shown to offer potential in this regard by averting the need for more costly medical interventions (Smit, Ederveen, Cuijpers, Deeg, & Beekman, 2006; van't Veer-Tazelaar et al., 2010).

A number of 'selective prevention interventions', which are designed to target individuals with known risk factors for depression, have been shown to reduce incident depression (Baldwin, 2000). For example, one study compared the use of the anti-depressant, Sertraline, with a placebo in a sample of stroke patients (67 per cent of whom were older adults; Rasmussen, Poulsen, Sorensen, Qvitzau, & Bech, 2003). In this study the incidence of depression was 8.2 – 11.5 per cent in the intervention group and 22.8 – 28.1 per cent in the placebo group. However, the low level of completion in this study (~50 per cent) limits its reliability. A further study compared an alternative anti-depressant, Escitalopram, to problem-solving therapy and a placebo in a sample of stroke patients (Robinson, Jorge, & Moser, 2008). Incidence of depression was significantly higher in the placebo group (22.4 per cent) compared to the group taking anti-depressants (8.5 per cent) and the group receiving problem-solving therapy (11.4 per cent).

Despite these promising results with anti-depressant medication, when given a choice, older adults with major depression or dysthymia prefer to receive psychotherapeutic treatments rather than anti-depressant medication (Gum et al., 2006). Furthermore, due to the absence of evidence that anti-depressants benefit those with mild depression, as well as the possibility of unwanted side-effects and

the medical risks associated with these drugs, psychological interventions are generally regarded more favourably for prevention of depression (Baldwin, 2010).

Carers of people with dementia have been identified as being at risk of depression (Joling et al., 2010) and although not designed as a prevention programme, a psychological intervention with pairs of dementia patients and their caregivers resulted in reductions in scores on the Beck Depression Inventory from sub-syndromal to non-case levels for the carers (Marriott, Donaldson, Tarrier, & Burns, 2000). In this study, family dyads were allocated to a cognitive behavioural based family intervention (involving carer education, stress management and coping skills training) or one of two control groups, one involving an in-depth interview with the carer and another involving usual care. Whilst this family programme appears a promising intervention, it is likely to prove costly, involving 14 sessions with a consultant clinical psychologist. In addition, it is unclear which elements of the programme were most effective (Baldwin, 2010). However, it shows potential as a preventative intervention due to its effectiveness in the reducing subclinical depressive symptoms.

Individuals with age-related macular degeneration¹ have also been found to have high rates of depression (Casten, Rovner, & Tasman, 2004). A selective intervention programme for older adults with recently diagnosed macular degeneration has provided promising results (Rovner, Casten, Hegel, Leiby, & Tasman, 2007). In this

¹ Macular degeneration is a painless eye condition that leads to the gradual loss of central vision and is most common in people over the age of 50.

programme, patients were randomly allocated to receive a problem-solving treatment or to treatment as usual. Patients receiving problem-solving treatment had significantly lower rates of incident cases of depressive disorders at two months. However, no such effect existed at the six month follow-up.

Several studies also report positive results for ‘indicated prevention interventions’ with older adults, which are targeted at individuals experiencing early or subsyndromal symptoms of depression. Ciechanowski et al. (2004) describe a study evaluating the effect of a package of problem-solving therapy, scheduling of pleasant activities, and consideration of the prescription of anti-depressant medication. Participants were randomly allocated to this programme or to usual care. The programme was associated with significantly higher rates of complete remission of depressive symptoms at six and twelve months.

In another study, van't Veer-Tazelaar et al. (2009) randomly allocated a sample of older adults with subthreshold levels of depression or anxiety symptoms to a stepped-care approach or to treatment as usual. This intervention involved four phases of increasing intensity; a watchful waiting phase, a cognitive behaviour-based bibliotherapy phase, a cognitive behaviour therapy-based problem-solving treatment phase and finally a referral for consideration of medication. Participants progressed through these phases only if their symptom levels remained elevated and, once scores fell below cut-off, a period of watchful waiting was reinstated until scores rose to elevated levels again. At the end of the twelve month study, the incidence of

depressive disorders was significantly lower in the intervention group (12 per cent) compared to the usual care group (24 per cent).

A prevention programme designed to target older adults with chronic pain using education about their condition as well as discussion of pain management strategies, was found to significantly reduce depressive symptoms at one- and two-year follow-ups, compared to a control group attending a similar style course focussing on community issues (Phillips, 2000). However, Cole & Dendukuri (2003) reviewed a number of prevention intervention studies for older adults, including the one above, and reported that half the studies included (five out of ten) did not report results indicating the superiority of the interventions over control groups. Therefore, in order to develop highly effective prevention programmes, we must continue to improve the identification of at risk groups and modifiable risk factors within the older adult population (Munoz, Cuijpers, Smit, Barrera, & Leykin, 2010). The current systematic review reported here contributes to the research base by providing an up-to-date overview of the risk factors for depression in recent cohorts of older adults, thereby building upon earlier reviews in the field (Cole & Dendukuri, 2003).

2.3 Method

2.3.1 Selection of Articles

Four databases, PsycINFO, CINAHL Plus with Full Text, Medline with Full Text, and Psychology and Behavioural Sciences Collection, were searched for potentially relevant articles published between January 2001 and May 2012. The search terms used were “depression,” “risk factor,” and “community.” Titles were reviewed and relevant articles were retrieved for further evaluation. These articles were screened to ascertain which ones met the following seven inclusion criteria: 1) original article published in English, 2) participants are community residents, 3) data provided on subjects aged 55 and over, 4) prospective design that excluded subjects who were depressed at baseline (or controlled for baseline depression in the analysis), 5) study of at least one risk factor for depression, 6) recognised definition of depression used (either recognised diagnostic criteria or cut-off on a depression rating scale), 7) odds ratios reported. Only those studies meeting all of these inclusion criteria were included in the review. The references of studies meeting these inclusion criteria were searched and relevant papers retrieved for evaluation and screening as above.

2.3.2 Assessment of Quality

In order to establish the validity of the findings reported within the included studies, the method of each study was assessed using eleven quality standards identified by the author based on a combination of sources (Higgins & Altman, 2011; Levine et al., 1994; Scottish Intercollegiate Guidelines Network, 2011). The quality criteria used were 1) clearly focussed research question, 2) similar comparison groups, 3) recruitment rate reported, 4) acceptable drop-out rate ($\leq 20\%$), 5) participants lost to

follow-up not significantly different from completers, 6) clearly defined outcome measure, 7) psychometrically robust outcome measure used, 8) same outcome measure used throughout, 9) main potential confounding variables taken into account, 10) sufficient length of follow-up (≥ 12 months), 11) confidence intervals (CI) provided. For each of the criteria, the studies were given a rating: well covered (3), adequately addressed (2), poorly addressed (1), not addressed (i.e. not mentioned or mentioned but with insufficient detail to allow assessment to be made; 0). An additional quality criteria referred to in the guidelines relates to the likelihood that some participants may meet criteria for the outcome at the time of enrolment and this must be taken into account in the analysis. As one of the inclusion criteria for this review was the exclusion of, or control for depression at baseline, it is considered that each included paper fully meets this requirement. In order to improve the reliability of the quality assessment, all articles were double rated, firstly by the researcher (AG) and also by a Consultant Clinical Psychologist (JH). Agreement between these two raters was 82 per cent and any disparity between the ratings resulted from only slight variation in the points given. The ratings given by the second rater can be found in Appendix 2.1.

2.3.3 Data Abstraction

Where available, key information was abstracted from each study and tabulated to aid summary and comparison. The information abstracted consisted of: the number of participants at baseline and follow-up, the age range and mean age, the proportion of males, the risk factor(s) studied, the comparison levels or groups studied, the criterion for depression, the exclusion criteria at baseline, the length of follow-up, the

number and percentage of incident cases of depression. In addition, the unadjusted odds ratios (95% CI), the confounders controlled for and the adjusted odds ratios (95% CI) are recorded. Finally, the variables found to be non-significant in predicting depression are presented.

2.4 Results

2.4.1 Selection of Articles

The search strategy is illustrated in Figure 2.1. The search strategy identified 489 potentially relevant studies, with 355 studies discarded based on their titles as it was clear they were not relevant. The remaining 141 were reviewed to establish their relevance, based on the abstract or full-text where necessary. Seven of these met the inclusion criteria. (Chan et al., 2012; Cho et al., 2008; de Jonge, Roy, Saz, Marcos, & Lobo, 2006; García-Fabela et al., 2009; Jaussent et al., 2011; Kim et al., 2011; Perlis et al., 2006). The remaining 134 were excluded for the following reasons: article not in English (2), participants not community residents (1), participants not over 55 years of age (35), not a prospective study excluding or controlling for baseline depression (61), not a study of a risk factor for depression (33), did not use a recognised definition of depression (1), did not report odds ratios (1). Two additional studies were identified from the reference list search and met inclusion criteria (Kim et al., 2008; Kim et al., 2006).

However, these latter two studies, along with the article published by the same group and identified in the original search strategy (Kim et al., 2011), would have made up one third of the studies in this review had they all been included. As these three papers all report data on the same sample of participants, it was decided that this would bias the results of the review. It was therefore decided to include only the earliest paper (Kim et al., 2006). This article was selected from the three as it was the only one assessing a direct predictive relationship between risk factors and incident depression. The two subsequent papers were concerned with the impact of

genetic characteristics on the associations established in the earlier paper. It was considered that these two papers, whilst adding to the fields' understanding of the role of genetics in the development of late-life depression, were not reporting easily identifiable or modifiable risk factors for depression and so would add little to the current review. This resulted in seven studies being included in the current review.

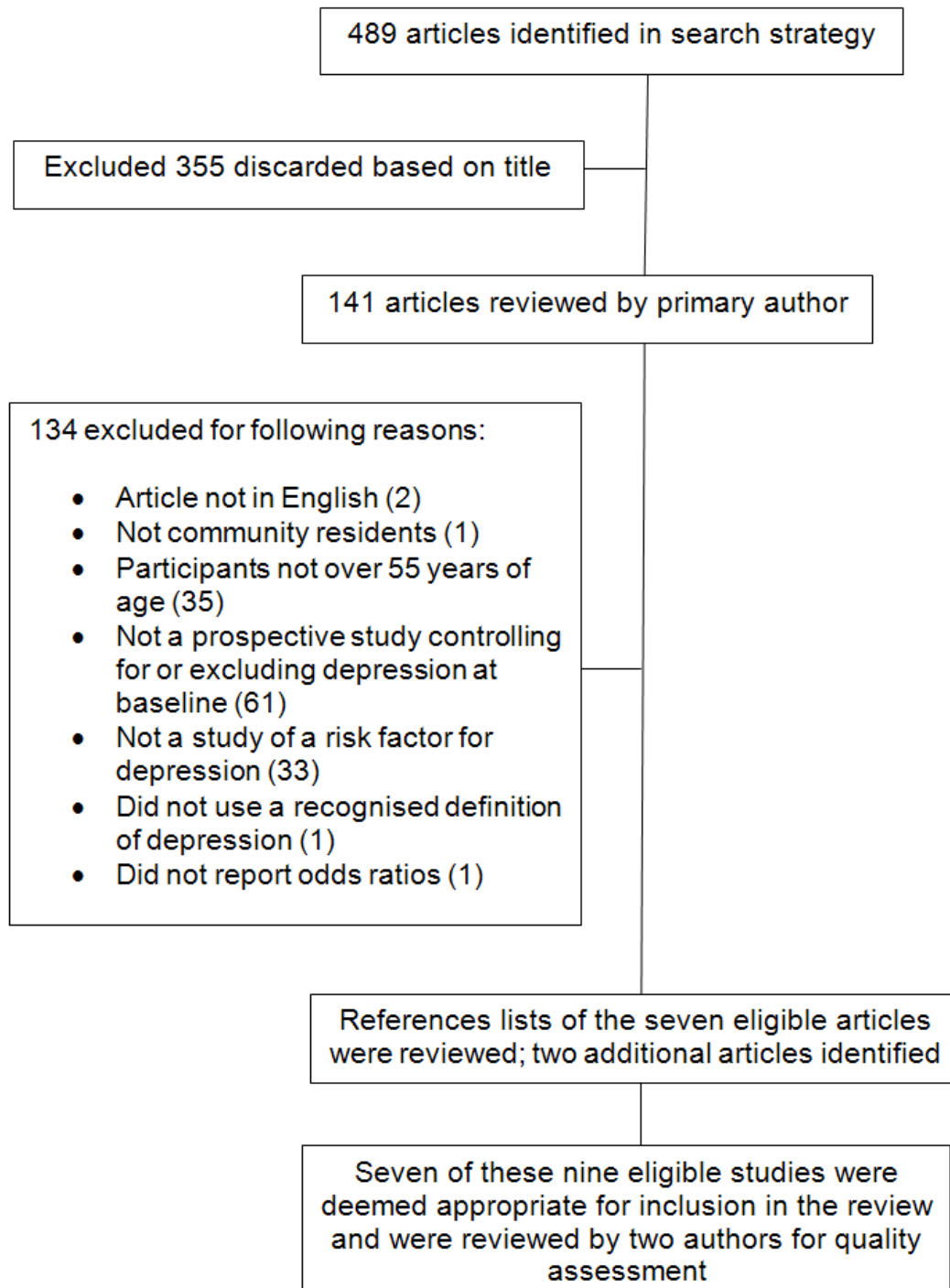


Figure 2.1 Flow chart of inclusion and exclusion of articles identified in the search strategy

2.4.2 Assessment of Quality

The quality of the published papers was variable (see Table 2.1). All studies addressed a clearly focussed research question, used a clearly defined, psychometrically robust outcome measure throughout the study, conducted a follow-up of sufficient length and provided confidence intervals. More variation in quality was apparent with regards to the comparability of the sample groups within studies, drop-out rates, comparability of completers with those lost to follow-up, and the number of potential confounders taken into account.

2.4.3 Data Synthesis

The information abstracted from the seven included studies is summarised in Table 2.2. In total 20,917 participants were involved in these studies at baseline and 12,885 were reviewed at follow-up, indicating an overall drop-out rate of 38 per cent. The numbers of participants at baseline and follow-up ranged from 189 to 7666 and 147 to 3824 respectively. The mean age of participants was reported in six studies and ranged from 68.4 to 73.5 years. The same six studies detailed the gender distribution, which ranged from 42.3 to 59.9 per cent male. There were a range of primary risk factors studied: stressful life events, insomnia, excessive daytime sleepiness, sleep disturbances, prior depression, hypertension, vascular disease risk and diabetes. Each risk factor was studied in only one study, with the exception of insomnia, which was assessed in three studies. Three studies used rating scales and four used diagnostic interviews to determine depression. Follow-up ranged from 12 to 60 months. Incident depression was reported in six studies and ranged from 8.2 to

28.7 per cent of participants and was generally higher in those using cut-offs on rating scales rather than diagnostic interviews.

Table 2.3 summarises the findings from the seven studies. Multivariate techniques revealed fifteen risk factors for depression. Rather than rely solely on the interpretations of the statistics reported by the individual authors, the reviewer regarded any confidence interval that crossed 1.00 to be non-significant at the 0.05 level and any confidence interval not crossing 1.00 to be significant at the same level (Laing & Rankin, 2011; Szumilas, 2010). In addition, the odds ratios are replicated from the original studies and the number of decimal places is dependent upon this original reporting.

The baseline factors predicting depression at follow-up were: higher baseline depression score, prior major or non-major depression (as diagnosed by the SCID²), antidepressant use (for those with prior depression), poorer physical component of quality of life (in men), lower HDL (high density lipoprotein) cholesterol, hypertension, pre-existing heart disease, diabetes, developmental object loss (in women), infrequent contact with relatives and friends (in women), lower education (for those with prior depression), prescribed sleep medication, insomnia (including sleep disturbance, “often” difficulty initiating sleep, “often” difficulty maintaining sleep and “often” excessive daytime sleepiness).

² Structured Clinical Interview for the DSM-IV

In terms of the strength of the relationship between the predictor variables and depression at follow-up, of all the factors reported, previous episodes of major depressive disorders reported the largest odds ratio (49.37). Smaller odds ratios were reported for previous history of non-major depression (13.73), experience of sleep disturbance (3.05-6.16), use of anti-depressant medication (for those with prior depression, 3.25-3.95), loss of one/both parents before the age of forty (2.72) and pre-existing heart disease (2.2). The remaining factors all reported relatively smaller odds ratios ranging from 0.50-1.62.

In addition, five of the studies (Chan et al., 2012; Cho et al., 2008; de Jonge et al., 2006; Jaussent et al., 2011; Kim et al., 2006) reported a number of variables with non-significant correlations with depression (Appendix 2.2). Non-significant variables included: age, gender, education, marital status, alcohol consumption, multi-morbidity, medical disease, pre-existing stroke, pre-existing hypertension, pre-existing diabetes, incident stroke, incident heart disease, incident hypertension, incident diabetes, an interaction between diabetes and co-morbidity, an interaction between diabetes and instrumental disability, an interaction between diabetes and basic disability, sleep quality, early morning awakening, homeopathic and non-prescription treatments for insomnia and anti-depressant medication. In addition, in those with prior episodes of depression, duration of last depressive episode and number of prior major depressive disorder episodes were not found to be significant predictors of depression in older adults.

Table 2.1 Validity of prospective studies of risk factors for depression among older adults according to quality criteria*

Study	Clearly focussed question	Similar comparison groups	Recruitment rate reported	Acceptable drop-out rate ($\leq 20\%$)	Participants lost to follow-up not significantly different	Clearly defined outcome measure	Psychometrically robust outcome measure	Same outcome measure used throughout	Main potential confounding variables taken into account	Sufficient length of follow-up (≥ 12 months)	Confidence intervals provided	Total (Maximum = 33)
Chan et al. (2012)	3	3	0	2	1	3	2	3	2	3	3	25
Jaussent et al. (2011)	3	3	0	0	1	3	2	3	3	3	3	24
García-Fabela et al. (2009)	3	3	0	1	1	3	2	3	3	3	3	25
Cho et al. (2008)	3	1	0	3	0	3	3	3	2	3	3	24
Kim et al. (2006)	2	3	0	2	3	3	3	3	2	3	3	27
de Jonge et al. (2006)	3	3	3	1	0	3	3	3	3	3	3	28
Perlis et al. (2006)	3	3	0	2	0	3	3	3	0	2	3	22

* Designed by the author, based on a variety of sources (Higgins & Altman, 2011; Levine et al., 1994; Scottish Intercollegiate Guidelines Network, 2011)

Scoring Key: 3 Well covered, 2 Adequately addressed, 1 Poorly addressed, 0 Not addressed (i.e. not mentioned, or indicates that this aspect of study design was ignored) or not reported (i.e. mentioned, but insufficient detail to allow assessment to be made).

Table 2.2 Prospective studies of risk factors for depression among older adults

Study	No. of subjects at baseline	No. of subjects at follow-up	Baseline age range (years)	Baseline mean age (years)	% male	Primary risk factor studied	Comparison levels/groups	Criteria for depression	Exclusion criteria at baseline	Length of follow-up (months)	Cases of incident depression (n)	Cases of incident depression (%)
Chan et al. (2012)	3203	2630	65+	71.7	59.9	Stressful life events (cross-sectional – not reported)	Number of life events, specific life events	Score ≥ 8 on Chinese version of GDS	Score >24 on MMSE, bilateral hip replacement, inability to walk independently	24	-	-
Jaussent et al. (2011)	7666	3824	65-85	-	-	Insomnia and EDS	3 groups: DEPs at no FU; only at 2-year FU, at 2-year and 4-year FU	CES-D Scale score ≥ 16	CES-D Scale score ≥ 16 , ADM	48	618	16.2
García-Fabela et al. (2009)	4628	3276	60+	68.4	52.1	Hypertension (HTA)	HTA vs no HTA	Score $\geq 5/9$ on modified CES-D	Score $\geq 5/9$ on modified CES-D	24	940	28.7
Cho et al. (2008)	351	329	60+	69.1*	45.6*	Prior depression and sleep disturbances	Prior depression vs no prior depression and sleep disturbance vs no sleep disturbance	SCID	Current depressive disorder, breathing-related sleep disorder, past history of axis I disorder	24	60	12

Table 2.2 Prospective studies of risk factors for depression among older adults (continued)

Study	No. of subjects (baseline)	No. of subjects (FU)	Baseline age range (years)	Baseline mean age (years)	% male (follow-up sample)	Primary risk factor studied	Comparison levels/groups	Criteria for depression	Exclusion criteria at baseline	Length of follow-up (months)	Cases of incident depression (n)	Cases of incident depression (%)
Kim et al. (2006)	631	521	65+	72.7 (follow-up sample)	44.9 (follow-up sample)	Vascular disease risk	Stroke, heart disease, hypertension, diabetes, total cholesterol, HDL, LDL, triglycerides	Rating of 3 or higher on AGECAT	Rating of 3 or higher on AGECAT	28	63	12.1
de Jonge et al. (2006)	4249	2158	55+	73.5*	42.3*	Diabetes	Diabetes vs no diabetes	Rating of 3 or higher on AGECAT	Reported elsewhere	60	374	12.9
Perlis et al. (2006)	189	147	60-94	71.7	43.5	Insomnia	No insomnia vs persistent insomnia	Consensus conference of raters and investigators based on SCID and HAMD	Lack of English fluency and without translator, gross communication impairment, any SCID diagnosis at baseline	12	12	8.2

*Mean age for the whole sample was calculated based on data for separate groups; ADM = Anti-depressant medication; CES-D = Center for Epidemiologic Studies Depression Scale; DEP-s = Depressive symptoms; EDS = Excessive Daytime Sleepiness; FU = Follow-up; GDS = Geriatric Depression Scale; GMS = Geriatric Mental State Schedule; GMS AGECAT = Geriatric Mental State-History and Aetiology Schedule – Automated Geriatric Examination for Computer Assisted Taxonomy; HAMD = Hamilton Rating Scale for Depression; HDL = high-density lipoprotein; LDL = low-density lipoprotein; MMSE = Mini-Mental State Examination; SCID = Structured Clinical Interview for the Diagnostic and Statistical Manual-IV.

Table 2.3 Findings of risk factors for depression among older adults from prospective studies

Study	Unadjusted odds ratio (95% CI) ($p<0.05$)	Confounders controlled for	Odds Ratio (95% CI) after controlling for potential confounders ($p<0.05$)
Chan et al. (2012)	-	No of life events, baseline GDS score, age, educational level, marital status, developmental object loss, contact of relatives or friends, alcohol consumption, multimorbidity, antidepressant medication use, physical component of SF-12	In men: GDS score at baseline 1.38 (1.27-1.51); physical component of quality of life (SF-12) 0.92 (0.89-0.96). In women: GDS at baseline 1.52 (1.37-1.67); one/both parents died before 40 years 2.72 (1.26-5.88); frequent contact with relatives/friends 0.50 (0.25-0.99)
Jaussent et al. (2011)	-	Sleep quality, difficulty initiating sleep, difficulty maintaining sleep, early morning awakening, study centre, CES-D baseline, gender, age, education, living alone, coffee consumption, alcohol consumption, smoking, chronic disease, past major depression, disability, prescribed sleep medication intake, homeopathic/non-prescription treatments for sleep	Insomnia 1.23 (1.01-1.49) (adjusted for EDS); “Often” difficulty initiating sleep 1.45 (1.01-2.10); “Often” difficulty maintaining sleep 1.40 (1.04-1.87); “Often” EDS 2.05 (1.30-3.23) (adjusted for insomnia); prescribed sleep medication (adjusted for insomnia) 1.62 (1.26-2.09) and (adjusted for EDS) 1.71 (1.33-2.20)
García-Fabela et al. (2009)	Hypertension 1.36 (1.14-1.56)	Age, sex, educational level, self-reported economic status, self-reported health, diabetes, arthritis, stroke, ischemic cardiopathy, falls, pain, visual impairment, hearing impairment, cognitive impairment, urinary incontinence, have a partner, smoking, ever use alcohol, disability for activities of daily living, disability for instrumental activities of daily living	Hypertension 1.18 (1.01-1.40)

Table 2.3 Findings of risk factors for depression among older adults from prospective studies (continued)

Study	Unadjusted odds ratio (95% CI) ($p < 0.05$)	Confounders controlled for	Odds Ratio (95% CI) after controlling for potential confounders ($p < 0.05$)
Cho et al. (2008)	-	a) Prior depression, sleep disturbance, other depressive symptoms, medical disease, age, gender, marital status, years of education	Prior depression (major or non-major) 38.65 (4.72-316.43); prior major depression 49.37 (5.92-411.67); prior non-major depression 13.73 (1.19-158.56); sleep disturbance 3.05 (1.07-8.75); baseline depressive symptoms 1.19 (1.07-1.33)
		As a), anxiety symptoms, physical functioning, bodily pain, social functioning	Prior depression 39.52 (4.09-381.51)
		b) For prior depression group: as a) plus time since last depressive episode, duration of last depressive episode, number of prior depressive episodes, antidepressant use	Adjusted hazard ratios for prior depression groups: sleep disturbance 4.84 (1.40-16.73), depressive symptoms at baseline 1.15 (1.02-1.30); education 0.77 (0.60-0.98); antidepressant use 3.25 (1.24-8.53)
		As b), anxiety symptoms, physical functioning, bodily pain, social functioning	Sleep disturbance 6.16 (1.48-25.69); antidepressant use 3.95 (1.42-11.01); education 0.76 (0.59-0.98)
Kim et al. (2006)	Heart disease 2.1 (1.3-3.3); lower HDL cholesterol 1.3 (1.1-1.6)	Age, gender, education, change in disability, baseline cognitive function	Pre-existing heart disease 2.2 (1.3-3.7); lower HDL cholesterol 1.3 (1.1-1.6)
de Jonge et al. (2006)	Diabetes 1.40 (1.03-1.90)	a) Age, sex	Diabetes 1.42 (1.04-1.93)
		As a), partner, education, hypertension, smoking, statin use, cognitive function, basic activities of daily living, instrumental activities of daily living, chronic somatic disease	-
Perlis et al. (2006)	Persistent insomnia 6.86 (1.30-36.09)	-	-

SF-12 = Medical Outcomes Study 12-item Short-Form Survey

Decimal places provided are replicated from the original studies

2.5 Discussion

2.5.1 Discussion of Results

The combined results of the seven prospective studies reviewed here point towards a wide range of indicators of enhanced risk for the development of depression, within medical, interpersonal, psychological and behavioural domains. This multi-component aetiology is widely accepted and other researchers have underlined the importance of conceptualising depression in older adults using a biopsychosocial model, which incorporates all of these domains (Blazer & Hybels, 2005).

Although all of the studies in the present review used clearly defined, psychometrically robust measures of depression as well as follow-ups of at least 12 months, the overall quality of the included articles was variable. The study by de Jonge et al. (2006) was rated as one of the higher quality papers using the selected quality criteria. De Jonge et al. (2006) reported that the odds of an individual with diabetes developing depression at follow-up were 1.42 times higher than those for an individual without diabetes. However, Kim et al. (2006) reported that pre-existing and incident diabetes during the follow-up period were not significantly associated with incident depression. This is an interesting disparity and one that can possibly be explained by the narrower focus of the study by de Jonge et al. (2006) compared to that of Kim et al. (2006), which was examining a range of vascular risk factors. Furthermore, when de Jonge et al. (2006) added 'chronic comorbid diseases' to the regression model, diabetes was no longer a significant predictor of depression. This suggests that the presence of chronic comorbid conditions accounts for the variance in incident depression. One interpretation of these results is that chronic medical

conditions, of which diabetes is one, are associated with an increased risk of developing depression, whilst the specific relationships between disease types and depression are less clear.

The study by Kim et al. (2006) was rated as one of the higher quality studies in the current review. Moreover, its focus on the impact of vascular risk factors means it can be considered a more open and exploratory paper than some of the other studies in the review that have a very narrower focus of interest. Kim et al. (2006) reported that the odds of an individual with pre-existing heart disease developing depression at two-year follow-up were 2.2 times higher than for an individual without cardiac disease. In addition, having a lower HDL cholesterol level was associated with 1.3 times the odds of developing depression when compared to those with higher levels of this cholesterol. Lower HDL is a risk factor for cardiac disease and it was for this reason that Kim et al. (2006) studied the relationship with depression. However, when analysing the association between lower HDL cholesterol and depression, Kim et al. (2006) did not control for the presence of pre-existing cardiac disease as a confounding variable, meaning that one cannot be sure the relationship between HDL cholesterol and depression is not moderated by a third variable such as cardiac disease. In addition, it would appear that the presence of pre-existing heart disease is a stronger predictor of depression than lower HDL cholesterol, making it a more useful risk factor for clinicians hoping to identify those at risk of developing depression. A further point of concern with this paper was the reporting of significant alpha levels ($< .05$) for odds ratios whose confidence intervals included the null value (1.0), which signifies that no significant difference has been observed

between a predictor and an outcome. Whilst it is advisable to make judgements on clinical significance apart from judgements about statistical significance, the reporting of results in this manner could be considered misleading and certainly goes against the general consensus amongst researchers (Laing & Rankin, 2011; Szumilas, 2010).

The study by Chan et al. (2012) was rated as being of moderate quality in comparison to the others included in the review. Chan et al. (2012) reported that the odds of males developing depression at follow-up increased 1.38 times for each increase of one unit in baseline depression score, as measured by the Chinese version of the GDS. Similarly, the odds of females developing depression increased 1.52 times for each incremental increase on the GDS. The odds of developing depression were 0.92 times higher for each incremental increase in score of the SF-12 for males, meaning that for each increase in SF-12 score, the odds of a male not developing depression at follow-up was 1.01. Whilst this is a very small odds ratio, a larger effect would be accrued if SF-12 score increased by a larger margin. Chan et al. (2012) also reported that for women, the odds of developing depression increased 2.72 times for individuals who had lost one or both parents before the age of forty and 0.52 times for an individual who “has relatives or friends, frequent contact.” However the meaning of this last association is not apparent and is not described clearly in the article. Furthermore, whilst it is reported as a significant result in this review, as the confidence interval does not cross the null value, the authors incorrectly reported it as having an alpha level of $> .05$.

Whilst in many respects the study by Chan et al (2012) was well conducted, the authors chose to assess the relationship between depression and life events cross-sectionally at follow-up. This analysis was not reported in the current review as it was not conducted prospectively. Measuring life events in this manner opened the study to the risk of retrospective bias, which is particularly significant in individuals with depressive symptomatology (Schraedley, Turner, & Gotlib, 2002). This is due to the negativity bias observed in depression (Clark, Beck, & Alford, 1999). This risk was not acknowledged by the authors and their discussion of the results focussed primarily on those aspects that related to life events, to the exclusion of the other risk factors which were measured longitudinally. This resulted in a lack of clarity regarding the specifics of some of these associations. For example, the relationship between social network and depression is unclear due to differing descriptions of the measurement of social network within the article.

The study by García-Fabela et al. (2009) was also rated as being of moderate quality compared to the others included in the present review. This paper describes the association between hypertension and depression remaining significant even after adjusting for a total of twenty confounding variables. García-Fabela et al. (2009) reported that the odds of developing depression was 1.18 times higher for those individuals reporting hypertension at baseline, compared to those without hypertension. However, hypertension was not measured objectively but was based on the participants' self-report of having been diagnosed with, and treated for hypertension. It is therefore possible that the risk factor observed is not hypertension per se, but patient knowledge of the diagnosis of the condition. The relationship that

the authors reported between hypertension and depression is in contrast to the results of Kim et al. (2006) who did not find hypertension to be a significant risk factor for depression using the same self-report method. It would appear that the study by Kim et al. (2006) has again reported non-significant findings that a study with a narrower focus (García-Fabela et al., 2009) has reported as significant, suggesting that these more focussed studies may be finding associations due to the absence of relevant confounding variables. It is possible that the relationship between hypertension and depression is mediated by another variable, such as perceived health status, which is a more subjective assessment than other measures of health and is possibly closely tied to the negatively distorted perceptions common in depression (Han, 2002).

The papers by Cho et al. (2008) and Jaussent et al (2011) were rated as being of lower quality compared to the other studies included in this review. Cho et al (2008) reported that the odds of developing depression at two year follow-up were 39.52 times higher for those with prior depression (major or non-major). When considered separately, this resulted in the odds of developing depression being 49.37 times higher for those with prior major depression and 13.73 times higher for those with prior non-major depression. In addition, baseline depression score and sleep disturbances also had significant odds ratios (1.19 and 3.05 respectively). The main limitation of the study by Cho et al. (2008) is the degree of difference between the group of participants with a previous history of depression and the comparison participants. The participants with a previous history of depression were significantly younger, more educated, less likely to be married and they reported higher baseline depression and anxiety scores. They also had higher rates of chronic

disease, poorer health related quality of life, higher pain scores, poorer social functioning, poorer sleep quality and higher rates of disturbed sleep. However, Cho et al. (2008) addressed this issue by ensuring that these factors were entered as covariates into the regression models. This paper highlights the contribution of prior depression as an identifiable risk factor for depression that although non-modifiable, could signal to health care providers that monitoring or prevention interventions may be beneficial. Furthermore, the results of the study by Cho et al. (2008) suggest that sleep difficulties may be a modifiable risk factor for depression and would therefore be a potential target for prevention interventions.

The relationship between sleep difficulties and depression was also investigated by Jaussent et al. (2011). In this study, the odds of developing depression were 1.23 times higher for individuals with insomnia, 1.45 times higher for individuals with difficulty initiating sleep, 1.40 times higher for individuals with excessive daytime sleepiness and 1.62-1.71 times higher for individuals taking prescribed sleep medication. Overall, these odds are all suggestive of an association with poorer sleep experience at baseline and increased rates of depression at four year follow-up. As above, this finding provides support for the importance of for early detection and intervention to treat these difficulties in an attempt to reduce to risk of depression. A limitation of this and a number of the other studies in this review was the absence of information regarding the level of the risk factor at follow-up. In this study, which had a long follow-up period, no intermediary assessments were made to determine the course of the sleep disturbances and their impact on levels of depressive symptomatology over time.

The study rated as having the poorest quality of those included in this review was by Perlis et al (2006). Perlis et al (2006) reported the odds of depression to be 6.86 times higher for those with persistent insomnia. This study had the smallest sample size of the seven included in this review by a considerable amount and the statistical analysis was conducted on an even smaller subsample of individuals with persistent insomnia (insomnia at baseline and follow-up). Whilst this approach ensured that transient insomnia symptoms did not impact the results, the study failed to capture the spectrum of sleeping difficulties reported by the subsequent studies (Cho et al., 2008; Jaussent et al., 2011). The narrower focus and poorer quality of this study limits its contribution to the current review and it is only due to the recurrent theme of sleep disturbance and depression in the papers by Cho et al. (2008) and Jaussent et al. (2011) that one can conclude that sleep difficulties may relate to incident depression in the current cohort of older adults, in a similar manner to that observed in previous cohorts (Cole & Dendukuri, 2003).

Overall, the risk factors identified by this review are comparable to previous studies. Vascular factors (e.g. heart disease), health status and infrequent social contact were factors identified by a recent review (Vink, Aartsen, & Schoevers, 2008). However, the review by Vink et al. (2008) had much wider inclusion criteria, including cross-sectional as well as longitudinal studies, and consequently reported a large number of additional risk factors, not found by the current review. Cole & Dendenkuri (2003) used comparable inclusion criteria to the current review and found bereavement, sleep disturbance, disability, prior depression and female gender to be significant risk factors for depression in older adults. Whilst sleep disturbance and prior depression

were also identified by the current review, the other factors were not. This discrepancy may be due to a number of factors such as differing cohort effects or differing trends in the focus of risk factor research over time.

2.5.2 Summarising aims

There are two key aims of research within this field. The first is to clarify which factors identify those at risk of developing depression in order that prevention interventions can be put in place. The second, concurrent aim is to identify modifiable risk factors that can themselves be targeted for intervention in order to prevent worsening of depressive symptoms or incident depression. This review highlights a number of modifiable risk factors including cholesterol level, blood pressure, infrequent contact with family and friends, and insomnia and other sleep disturbances. Indeed, cholesterol level and blood pressure can be well controlled medically (Cholesterol Treatment Trialists' (CTT) Collaborators, 2005; Musini, Tejani, Bassett, & Wright, 2009) and through lifestyle changes (Applegate et al., 1992). Infrequent contact with family and friends, insomnia and other sleep disturbances all have the potential to be addressed by psychological approaches. CBT for insomnia has been shown to have positive results in older adults (Alessi & Vitiello, 2011) and scheduling of social activities is a regular part of CBT for depression and has been shown to be a useful component alongside other elements of CBT, in the prevention of recurrent depression in adults of working age (Ludman et al., 2003).

2.5.3 Limitations

This review adds further detail to the building evidence base of risk factors for depression among older adults. It has applied strict inclusion and validity criteria in order to highlight the findings from the highest quality papers available at this time. A comprehensive quality assessment process was used, based on the most robust quality assessments currently in use (Higgins & Altman, 2011; Levine et al., 1994; Scottish Intercollegiate Guidelines Network, 2011). Rather than adopt a single quality assessment strategy, the author selected relevant criteria from a variety of sources, discarding irrelevant standards such as those relating to randomised controlled trials.

In addition, it updates the work of other reviews within the most recent cohort of older adults studied. However, there are a number of limitations that must be acknowledged. Firstly, the literature search, data abstraction, synthesis and analysis were conducted primarily by the researcher (AG). However, input from senior academic and clinical colleagues was sought at several junctures to ensure unbiased reporting and the quality of the papers was cross-rated by a Consultant Clinical Psychologist (JH) in order to improve reliability.

Secondly, the stringency of the inclusion criteria resulted in a restricted pool of studies being reviewed. A large group of studies excluded were cross-sectional in nature. Although there is good reason to evaluate the evidence from cross-sectional and longitudinal studies separately, the exclusion of these papers is likely to have led to an omission of additional risk factors. For example, McGuire et al. (2009) published data on a large and well conducted cross-sectional study with older adults

in the USA that found younger age, lower education, an income of less than \$50,000, poorer self-rated health and having a disability to be risk factors for depression. Whilst some of these findings are supported by the longitudinal studies included in this review, income is an additional risk factor not covered in the reviewed articles. As such, there is the potential for this review to selectively omit those risk factors currently only identified in cross-sectional studies.

Thirdly, the exclusion of studies which included depressed individuals or failed to control for baseline depression has resulted in a narrower sample pool than the general population. This decision was made in order to avoid the risk of retrospective bias and the influence of pervasive negative perceptions amongst depressed individuals (Devanand, Kim, Paykina, & Sackeim, 2002). However there this likely to be a range of risk factors not reported on here due to this chosen methodology.

A final limitation of this review was not in relation to the methodology employed but rather in relation to the breadth of literature available to the researcher. The risk factors reported in this systematic review could be considered limited to the interests of the original researchers who often investigated a very small pool of potential risk factors. In addition, the role of some of the variables in predicting depression is questionable, due to conflicting results in other studies. To counter this tendency, future studies of risk factors for late life depression should be conducted so as to capture a broader range of risk factors, as in previous cohorts (e.g. Kennedy, Kelman, & Thomas, 1990).

2.5.4 Clinical Implications

There are a number of clinical implications arising from the current review. A number of 'at risk' groups were identified, including those with a range of medical conditions which necessitate regular contact with health professionals and who are therefore more easily targeted for screening than the general population. The incidence of depression ranged from 12.1 to 28.7 per cent in the studies in the current review that were assessing patients with cardiac conditions or diabetes (de Jonge et al., 2006; García-Fabela et al., 2009; Kim et al., 2006). These figures suggest that a significant minority of older adults with these health conditions may be at an increased risk of developing depression, therefore highlighting the importance of continued screening for depression by diabetes and cardiac services (Lichtman et al., 2008; National Collaborating Centre for Chronic Conditions, 2008; NHS Diabetes, 2010).

In addition, a number of modifiable biological and psychosocial risk factors were identified which may help to inform the development of future preventative psychological interventions. Mental health services may consider the provision of preventative interventions particularly aimed at reducing sleep disturbances. In order to do this, adaptations may be made to widely used low level psychological interventions such as community based psycho-educational stress classes (Brown, Elliott, & Butler, 2006; J. S. L. Brown, Cochrane, & Hancox, 2000; White, Keenan, & Brooks, 1992). Specific adaptations may be required to target older adults in particular, who have not previously been the focus of such interventions. In addition, it may be that the syllabus used in these classes could be adapted to include methods for improving sleep.

Alternatively, depression prevention programmes that have been developed may be an appropriate medium for targeting older adults (Phillips, 2000; van't Veer-Tazelaar et al., 2009). Van't Veer Tazelaar et al (2010) have presented preliminary evidence of the cost-effectiveness of one such programme and whilst it was a relatively costly endeavour, the results suggest that it was acceptable to the vast majority of those attending. Moreover, the stepped care approach used by van't Veer-Tazelaar et al. (2009) offers a model to commissioners of mental health services for older adults that could be adapted in different localities in order to offer the least intensive and least costly interventions first. However, more research is required before programmes such as these are widely recommended. In particular, future research should endeavour to assess a wider range of risk factors of depression in order that services can effectively target those individuals most at risk of developing depression.

2.6 Conclusion

In conclusion, the current review identified a smaller number of studies than previous reviews, including one using identical inclusion criteria (Cole & Dendukuri, 2003), suggesting that fewer studies have been published on this topic in recent years. In addition, the risk factors studied in the included papers appear to be restricted to the researchers' own areas of interest and the resultant list of risk factors for depression in older adults is somewhat sparse. However, this review provides additional evidence of the importance of screening for depression by medical teams providing care for people with long term conditions. Furthermore, based on the results of this review, mental health services could consider providing community courses for older adults aimed at addressing sleep difficulties in an attempt to reduce the risk of depression.

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3.0 Bridging Chapter

Whilst the systematic review in the preceding chapter has outlined much of the rationale for the current study, there are a number of other factors that led to the development of this thesis. Firstly, it was designed in order to test a clinical hypothesis that older adults who relocate to a rural area of Scotland in their retirement have poorer psychological health than those who have spent their working lives in the region. This tentative hypothesis was initially made by clinicians who had worked in the region for a number of years and were of the opinion that a disproportionate number of their patients were from out with the area. There is inconclusive evidence of the impact of relocation on psychological health in retirement, with some researchers finding no impact (Lutgendorf *et al.*, 2001) and others reporting poorer psychological health amongst relocators compared to non-relocators (Davies, 2003). This study was therefore designed to investigate this issue in a sample of older adults in rural Scotland, thereby adding to the current research base.

In addition, this study was undertaken in order to determine identifiable risk factors in older adults that might serve as markers to primary health care providers to support the identification and treatment of poor psychological health. Finally, this study was conducted in order to identify risk factors that may be open to adaptation using a psychological perspective, through evidence based treatments for older adults, such as cognitive behaviour therapy (CBT, Laidlaw *et al.*, 2008).

4.0 Hypotheses

There were three hypotheses tested in this study:

Hypothesis one: There will be a significant difference between relocaters and non-relocaters with regards to psychological health, as measured by scores on the HADS, WHOQOL-BREF and CORE-OM.

Hypothesis two: There will be a significant difference between those who consider themselves to be “locals” and those who consider themselves to be “incomers” with regards to psychological health, as measured by scores on the HADS, WHOQOL-BREF and CORE.

Hypothesis three: demographic factors (gender, age, marital status), health factors (self-rated health, current medication for long-term conditions, number of conditions seeing a doctor for, number of prescribed medications), social factors (social network size, spousal relationship quality, social support from family, friends and a significant other), attitudes to ageing (psychosocial loss, psychological growth and physical change), number of life events in the last year, and relocation status (relocater versus non-relocater) would each significantly account for, and contribute to the variance in psychological health (as measured by the HADS, WHOQOL-BREF and CORE-OM).

5.0 Method

5.1 Design and Procedure

Participants were volunteers recruited from a random sample drawn from the Community Health Index (CHI) of a rural health board region in the South of Scotland. The study utilised a cross-sectional design in which participants completed the questionnaires at one time point.

Inclusion criteria for participation in the study were as follows: (1) fifty-five years or older, (2) retired³ at or after the age of fifty-five, (3) community dwelling (not residing in nursing or residential care), (4) ability to complete the questionnaires unaided, (5) residing at a postcode assigned to the region. An additional inclusion criterion separated the relocated group and the non-relocated group. Relocaters had to have relocated to the region within the last five years (6a). Non-relocaters had to have resided in the region for at least twenty years (6b).

The researcher (AG) provided staff within the Public Health Department of NHSDG with the inclusion and exclusion criteria in order that they could draw a random sample of 1080 individuals from the CHI who met the criteria listed above. All GP registered patients in the region, over the age of 55, were identified and from these, two lists were drawn, one consisting of individuals who had been registered with a GP in the region for five years or less (Group 1, relocaters) and the other consisting of individuals who had been registered with a GP in the region for 20 years or more

³ An open criteria for “retirement” was used that included identification with any of the following: self perception as retired, main income altered from wages to pension based funds, significantly reduced working hours to less than half previous hours.

(Group 2, non-relocaters). Whilst the majority of individuals are registered with a local GP practice, certain groups such as travelling communities, prisoners, members of the armed forces and itinerant workers may not be, meaning the sample was not entirely random.

Each individual was assigned a random number using a random number generator and these were then sorted numerically and the first 270 were selected from each group to receive an information and questionnaire pack (see Appendix 3). This process was repeated after two months to ensure adequate sample size, excluding the individuals drawn in the first sample. Figures 2.1 and 2.2 illustrate the sampling and recruitment procedures.

Each individual in the sample was sent an information and questionnaire pack, containing an invitation letter, information sheet, letter of endorsement from the Cauldicott Guardian for the CHI in NHSDG, a questionnaire booklet and a stamped, addressed envelope for questionnaires to be returned to the researcher. Questionnaires were colour coded to distinguish between Group 1 (relocaters) and Group 2 (non-relocaters). Staff within the Public Health Department of NHSDG were responsible for handling all personal details of the sample including the random number selection and the addressing of envelopes prior to postage. This was done in order to ensure anonymity of the sample.

Upon receipt of the information and questionnaire pack, individuals were prompted to consider whether they met the inclusion criteria listed above. As the CHI contains

the individual's date of birth, the sample were all within the appropriate age range. In addition, the addresses of potential participants were cross-checked against the postcodes of nursing and care homes within the region, thereby reducing the risk of packs being sent to non-community dwelling individuals. Furthermore, the date of registration with any GP within the region was taken as an indicator of residency length within the region. Whilst this was accurate in most cases, some relocated participants indicated that they had lived in the area longer than five years, suggesting that there was a period of delay in them registering with a GP. In cases where an individual indicated that they had lived in the region for longer than five years and less than twenty, they were excluded from the analysis. In addition, due to the absence of a centralised register of retirement status, a number of individuals who were sent packs would not have been retired. Therefore, despite the best efforts of the researcher and the Public Health Department, not all individuals who received an information and questionnaire pack were eligible to participate.

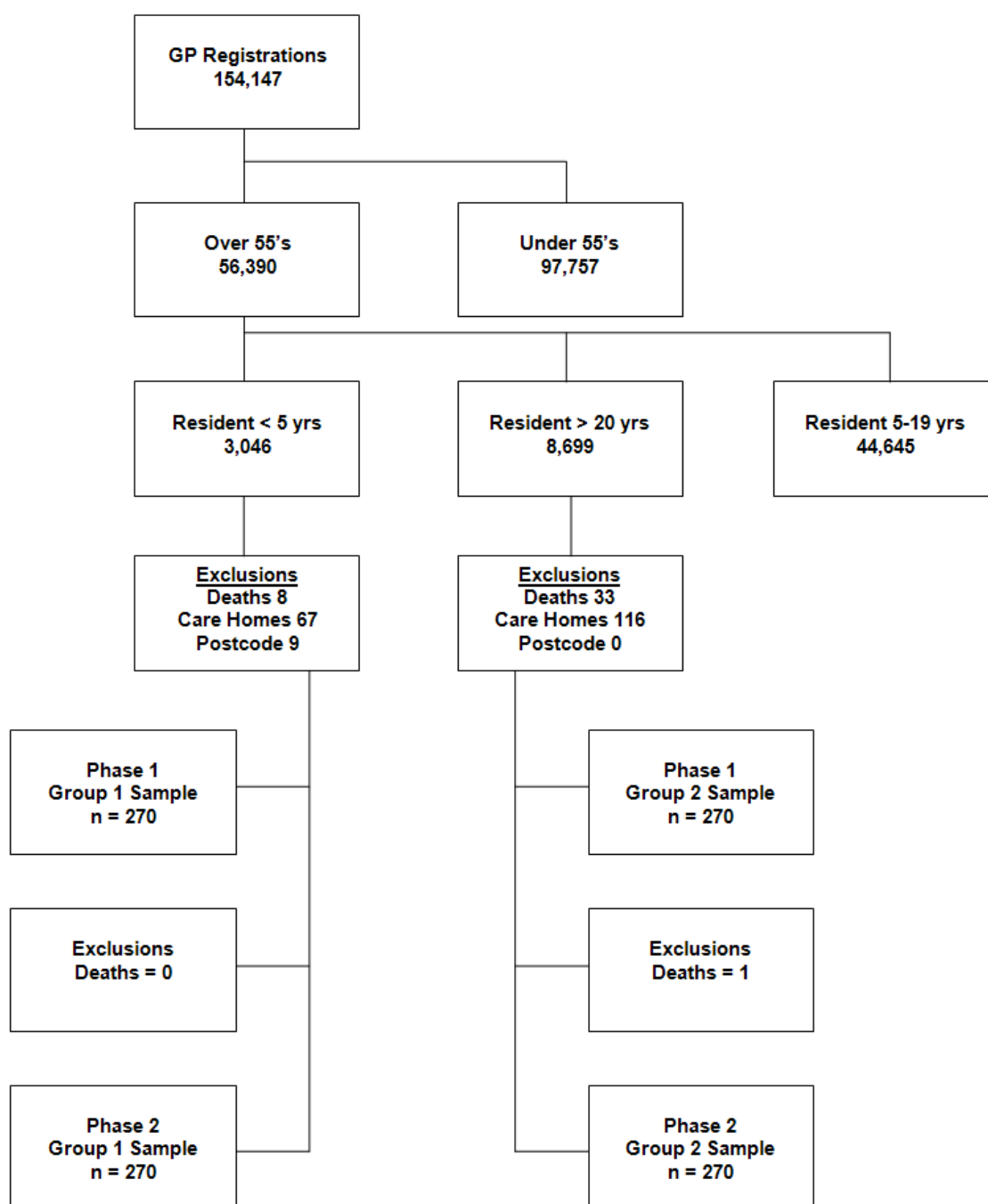


Figure 5.1 Flow chart outlining the sampling procedure employed by Public Health Department of NHSDG

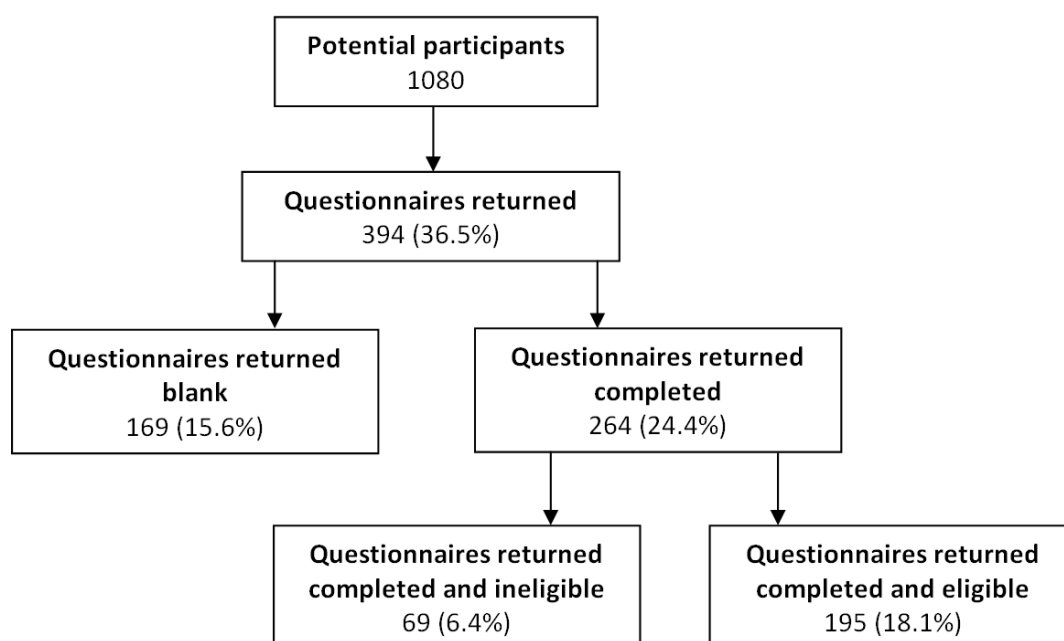


Figure 5.2 Flow chart of recruitment process

Individuals who met the criteria were asked to complete the questionnaires and return them in the pre-paid envelope provided. The questionnaire booklet consisted of validated and non-validated questionnaires and was estimated to take approximately 45-60 minutes to complete. No identifiable data was requested within the questionnaire booklet, ensuring that anonymity was maintained. Individuals who did not wish to take part, or who were not eligible, were prompted in the information sheet, to return the questionnaires uncompleted.

5.2 Participants

One hundred and ninety-six individuals responded to the mail out and returned completed and eligible questionnaires. This equates to an 18.1 per cent response rate. The sample consisted of 109 relocaters (Group 1) and 87 non-relocaters (Group

2). Overall, there were 96 males (49.5 per cent) and 98 females (50.5 per cent), with a mean age of 70 years (SD 7.7, range 56-99). Seventy per cent of the sample were married or living as married and 85 per cent considered themselves to be in good health, with 69 per cent taking medications for long-term health conditions. Less than eight per cent of the sample were smokers, and 69 per cent reported drinking alcohol. Please see Table 7.1 for full details.

5.3 Measures

The primary outcome measures in this study consisted of three self-report measures, Hospital Anxiety and Depression Scale (HADS), World Health Organisation Quality of Life-BREF (WHOQOL-BREF), and Clinical Outcomes in Routine Evaluation – Outcome Measure (CORE-OM). The secondary outcome measures included three validated self-report measures; Attitudes to Ageing Questionnaire (AAQ), Multidimensional Scale of Perceived Social Support (MSPSS) and Geriatric Life Events Inventory (GALES). In addition, two non-validated measures were used: the Hierarchical Mapping Technique and a short measure of spousal relationship quality. A demographic questionnaire was also included. These measures will be discussed in turn below and can be found in Appendix 3.

5.3.1 Primary outcome measures

Hospital Anxiety and Depression Scale (HADS)

The HADS (Zigmond & Snaith, 1983) is a well validated and widely used screening tool for depression and anxiety which has been used extensively within the older adult population (Cheung *et al.*, 2012; Schnittger *et al.*, 2012; Solhaug *et al.*, 2012).

It is a 14-item questionnaire, with seven questions relating to depression symptoms (HADS-D) and seven relating to anxiety symptoms (HADS-A). The absence of items relating to the somatic symptoms of depression and anxiety allow for screening within populations with physical complaints. Although many older adults enjoy good health, 69 per cent of this sample had long-term conditions such as cardiac disease, chronic pain and diabetes. This pattern was anticipated and it was for this reason that the HADS was selected.

Items on the HADS questionnaire are worded in the first person and comprise a statement that requires endorsement in terms of how frequently or intensely the item has been experienced within the past week. Responses are scored using a four item Likert scale. For example, for the item “I feel tense or ‘wound up,’” respondents can answer: most of the time (3), a lot of the time (2), from time to time/occasionally (1) or not at all (0). Scores range from 0-21 for each of the two subscales, with higher scores indicating more severe symptomatology.

Within older adult samples, the internal consistency (Cronbach’s α) of the anxiety subscale has been reported to be .81 to .82 and that of the depression scale has been reported as .71 to .75 (good and adequate respectively; Mykletun, Stordal, & Dahl, 2001; Spinhoven *et al.*, 1997). In a well-conducted literature review of studies with adults and older adults, Bjelland *et al.* (2002) reported medium to strong correlations between the HADS and other widely used questionnaires such as the Beck Depression Inventory (Beck *et al.*, 1961) and the State-Trait Anxiety Inventory

(Spielberger, Gorsuch, & Lushene, 1970), indicating good concurrent validity of the scale.

This same study concluded that, based on the research literature, optimal sensitivity and specificity is achieved when a cut-off score of 8 is used on both the HADS-D (HADS depression scale) and HADS-A (HADS anxiety scale; Bjelland *et al.*, 2002). However, lower optimal cut-off levels have been reported in older adult samples. One study with older adults in Hong Kong, found the optimal cut-off level on the HADS-D to be 6 (sensitivity 55 per cent, specificity 95 per cent) and on the HADS-A to be 3 (sensitivity 70 per cent, specificity 93 per cent; Lam *et al.*, 1995). In addition, a study with older adults with chronic heart failure reported optimal cut-off scores of 4 or 6 on the HADS-D (sensitivity 86 and 77 per cent, specificity 79 and 89 per cent, respectively) and 7 on the HADS-A (sensitivity 94 per cent, specificity 85 per cent).

World Health Organisation Quality of Life-BREF (WHOQOL-BREF)

The WHOQOL-BREF (The WHOQOL Group, 1998) is a 26-item measure of quality of life. It contains four domains related to different components of quality of life: physical health, psychological health, social relationships and environment. In addition, it contains two items which can be analysed alone: self-rated overall quality of life and self-rated general health. Participants are directed to answer based on their experience over the last four weeks. Responses are made on five item Likert scales, which vary in their descriptors, according to the question. For example, in response to the question, “How satisfied are you with the conditions of your living

place?” participants could answer, very dissatisfied (1), dissatisfied (2), neither satisfied nor dissatisfied (3), satisfied (4) or very satisfied (5). Scores are calculated by multiplying the mean domain score by four (resulting in a score between 4 and 20 comparable with the WHOQOL-100). These domain scores can be further converted by subtracting four and multiplying by 6.25 to transform all scores to a 0-100 score. Higher scores on the WHOQOL-BREF denote higher quality of life. The transformed domain scores were used in this study.

The WHOQOL-BREF is an abbreviation of the WHOQOL-100 (Power, Bullinger, & Harper, 1999). It was developed using data on the WHOQOL-100, gathered from 28 field centres in countries across the world, including UK, Spain, Croatia, India, Israel and USA. Each of the centres had administered the WHOQOL-100 to approximately 300 individuals with a range of health problems and the results were combined to establish a shorter version which would be more easily incorporated into research studies, compared to the more time-consuming 100-item questionnaire.

The WHOQOL Group (1998) reports that the WHOQOL-BREF has good discriminant validity, effectively discriminating between ill and well participants. In addition, it has good internal consistency ranging from .66 (social relationships domain) to .84 (physical health domain). The test-retest reliabilities, assessed predominantly with well participants 2-8 weeks after baseline, ranged from .66 (physical health) to .87 (environment), indicating good test-retest reliability.

Furthermore, the WHOQOL-BREF has been widely used in studies with older adults (Chachamovich *et al.*, 2008; Helvik, Engedal, & Selbæk, 2010; Murray *et al.*, 2011) and has been validated for use within this age group (Hwang *et al.*, 2003). Hwang *et al.* (2003) reported that the four domain scores had excellent discriminant validity with older adults, differentiating between those who had a fall, depression or cognitive impairment and those who did not. In addition, they reported excellent construct validity as well as good internal consistency (.73 to .81) and test-retest reliability (.77 to .94), in a sample of 1200 community dwelling older adults in Taiwan.

Clinical Outcomes in Routine Evaluation–Outcome Measure (CORE–OM)

The CORE–OM (Evans *et al.*, 2000) was developed in order to provide a ‘core’ measure of outcome in psychological therapy settings, due to the multiplicity of measures available. It is a 34-item measure and has four domains: well-being, problems/symptoms, life functioning and risk to self and others. Domain scores and total scores are calculated as means. Each item consists of a statement that the respondent must rate in terms of how they have been feeling in the past week, using a four item Likert scale. For example, for the item, “I have felt O.K. about myself,” respondents could answer: not at all (4), only occasionally (3), sometimes (2), often (1), or most/all the time (0). Higher scores on the CORE–OM indicate poorer outcomes.

The CORE–OM has been widely accepted and embedded within clinical service evaluations in Britain and North America (Evans *et al.*, 2003). This is possibly due

to it being available without charge. Furthermore, it has been reported to have good internal reliability (.75 to .94) and test-retest reliability (.87 to .91) with the exception of the risk domain (.64), which the authors explain as being due to the “situational, reactive nature of these items,” (Evans *et al.*, 2002, pp.53). In addition, the authors of this measure have reported that it has good concurrent validity, with correlations with relevant alternative measures ranging from .55 to .85 for the total score.

Importantly, the CORE-OM has also been validated for use within the older adult population (Barkham *et al.*, 2005) and retains its high level of internal consistency for total score in both clinical (.90) and non-clinical (.83) samples. However, the authors report lower reliability levels when the domains were analysed separately and point to the use of the overall mean as the more reliable measure with older adults. It was also found that clinical scores within these older adult samples were lower than for adults of working age, and lower cut-offs, of 0.95 for males and 0.97 for females, was recommended for older adults. This is compared to 1.19 for males and 1.29 for females, of working age (Barkham *et al.*, 2001).

5.3.1 Secondary outcome measures

Attitudes to Ageing Questionnaire (AAQ)

The AAQ (Laidlaw, Power, & Schmidt, 2007) is a 24-item self-report measure that assesses the subjective experience of ageing at an individual level and the perception of attitudes towards ageing at a more general societal level. It is organised into three domains: psychological growth, psychosocial loss, and physical change, with each domain containing eight items. Items are scored on a five-point Likert scale and

domain scores range from 8-40, with higher scores indicating more positive attitudes towards ageing. Participants are directed to indicate how much they agree with a statement or how true they feel it is. For example, for the item “My health is better than I expected for my age,” participants could answer: not at all true (1), slightly true (2), moderately true (3), very true (4) or extremely true (5).

The AAQ was developed using a comprehensive and empirical process, based upon current gerontological theory and established psychometric analytic methods, including factor analysis and structural equation modelling. During its development, the AAQ was piloted in 15 field centres worldwide and it was reported to demonstrate acceptable internal consistency (.74 to .81), good test-retest reliability and good discriminant and concurrent validity (Laidlaw *et al.*, 2007). In addition, this measure has been validated for use in independent samples of older adults in Canada, Norway (Kalfoss, Low, & Molzahn, 2010) and China (Huang *et al.*, 2010).

The AAQ offers a unique contribution to the field of gerontological studies due to being specifically designed for older people and having been subject to thorough testing in a very large international sample, which has shown it to have robust psychometric properties. In addition, its style of questioning focuses on individual and general attitudes, making it a flexible measure which provides a profile of attitudes across three domains which span both the losses and the gains associated with ageing, thereby providing a comprehensive picture of individuals’ experiences of ageing.

Multidimensional Scale of Perceived Social Support (MSPSS)

The MSPSS (Zimet *et al.*, 1988) is a 12-item self-report measure of subjective social support that contains three subscales related to different sources of support; family, friends and significant other. Ratings are made on 7-point Likert scales ranging from *very strongly disagree* (1) to *very strongly agree* (7), with subscale scores ranging from 4 to 28. Participants are directed to indicate which number best represents how they feel about each statement. For example, “there is a special person who is around when I am in need.” A total score can also be calculated by summing each subscale total but this score was not used in the current study.

The MSPSS was originally validated with university undergraduates and was reported to have good internal consistency (.85 to .91), good test-retest reliability (.72 to .85) and adequate construct validity (Zimet *et al.*, 1988). However, its construct validity was assessed by means of correlation with measures of anxiety and depression, which, while related to social support, do not tap into the same constructs. Another validation study was conducted shortly after the scale was first published (Zimet *et al.*, 1990), in which the scale was completed by a wider sample of participants and was reported to have good internal consistency (.81 to .98).

Importantly, this scale has also been validated for use within the older adult population (Stanley, Beck, & Zebb, 1998) and has been used extensively in research with this population (Cernin, Lysack, & Lichtenberg, 2011; Paukert *et al.*, 2010; Simning *et al.*, 2012). Stanley *et al.* (1998) evaluated the validity of the MSPSS within a moderately sized sample of old adults with generalised anxiety disorder

($n=50$) and a larger sample without any psychopathology ($n=94$). Internal consistency was good (.87 to .94) and test-retest reliability was adequate (.73 to .74) for friends and family subscales. However, a weaker correlation was reported on the significant other subscale, although test and retest scores did not differ significantly. In addition, the sub-scale validity and factor analyses were comparable with the results from younger adults.

Geriatric Adverse Life Events Scale (GALES)

The GALES (Devanand *et al.*, 2002) is a 26-item measure of adverse life events designed specifically for use with older adults. It was developed by selecting items from pre-existing scales used within the adult population, such as the Social Readjustment Rating Scale (Holmes & Rahe, 1967) and the PERI Life Events Scale (Dohrenwend *et al.*, 1978). A number of additional items were included in order to evaluate acute, major adverse life events that are commonly experienced by older adults. Devanand *et al.* (2002) designed the GALES to be used as a self-report measure of the number of life events and a subsequent structured interview to evaluate the degree of stress induced by the event and also the event's impact on their mood.

For the purpose of this study, the standardised interview was replaced with two extra questions on the self-report measure. As such, participants were directed to read the list of adverse life events and to circle 'Y' if the event had occurred in the last year and 'N' if it had not. This is the same procedure as in the original study (Devanand *et al.*, 2002). For any event that had occurred, participants were asked to complete a

rating for two follow-on questions. The first question was “How stressful was this event?” The response options were: not at all stressful (1), somewhat stressful (2) or very stressful (3). The second question was “How did this event make you feel?” The response options were: much better (1), better (2), the same (3), worse (4), much worse (5). Whilst, as the original authors highlight, higher reliability is achieved by interviews (Funch & Marshall, 1984), the present study did not lend itself to this approach and the interview questions were instead used in questionnaire form.

The GALES was originally validated in a moderately large sample of older adults with major depression or dysthymic disorder and healthy controls. Due to the intrinsic independence of scale items, the scale’s internal consistency was not calculated. However inter-rater reliability was high (.96 to .99) and the discriminant validity of the scale was demonstrated by its ability to distinguish between healthy controls, those with major depression and those with dysthymic disorder.

The GALES was selected for inclusion in the current study as it is the only identified measure evaluating life events in older adults. Many life-event rating scales designed for adults of working age include items not relevant to an older adult population whilst omitting items of relevance in later life (Cochrane & Robertson, 1973; Paykel, Prusoff, & Uhlenhuth, 1971). Therefore, it was deemed appropriate to select a tool designed and validated for this age group.

Hierarchical Mapping Technique (HMT)

The HMT was developed by Antonucci (1986) as a measure of social network size. Four concentric circles are presented to the participant, with the smallest circle representing them. In the next largest circle, they are directed to write the first names of the people to whom they feel so close that it is hard to imagine life without them. The next largest circle is to include people to whom they may not feel quite so close but who are still very important to them. In the largest circle they are asked to include people who they have not already mentioned but who are close enough and important enough in their life that they should be placed in their personal network. The total number of names is taken to denote the network size.

Whilst this technique has been used extensively over the years, it has only recently been subjected to psychometric analysis. Rowe & Carnelley (2005) report the level of correlations between this measure and the Attachment Network Questionnaire (ANQ; Trinke & Bartholomew, 1997) in young adults and found moderate to large correlations ($r = .3$ to $.5$), indicating that the HMT has good construct validity. Although it has not been specifically validated for use within the older adult population, this approach has been used in a number of studies with older adults (Fiori, Smith, & Antonucci, 2007; Lang & Carstensen, 1994; Maier, 1999) and was selected for its speed and ease of completion as well as its flexibility over more restrictive methods of social network structure (e.g. ANQ; Trinke & Bartholomew, 1997), which force participants to rank network members in an order, thereby restricting the representation of the network (Rowe & Carnelley, 2005).

Spousal Relationship Quality Questions

Antonucci and colleagues (Fuller-Iglesias, Sellars, & Antonucci, 2008) have developed a seven question assessment to measure spousal relationship quality with older adults. This scale built upon the author's previous work (Antonucci, Lansford, & Akiyama, 2001) and has been used by Antonucci and her colleagues (Birditt & Antonucci, 2007) with adults of working age and older adults. Five questions assess positive aspects of spousal relationship whilst the two remaining questions assess negative elements of a relationship. The questions are answered on a five point Likert scale, ranging from 1 (agree) to 5 (disagree). Items are worded in the first person, for example, "I enjoy being with my spouse." The two negative items are reverse scored and a total score is calculated from the sum of the positive and negative items. Despite the absence of validation studies for this measure, the alternative marital satisfaction questionnaires for older adults are much longer (Clements & Swensen, 1999; Haynes *et al.*, 1992) and were therefore deemed to be inappropriate for this study, in which various constructs were being assessed and it was crucial to avoid overburdening participants.

Demographic Questionnaire

A brief demographic questionnaire was designed to collate information on gender, date of birth, marital status, socio-economic status (for which working role was used as proxy) and length of retirement. Participants were also asked to state the length of their residency in the region, and, if five years or less, to specify where they previously lived and/or worked and the reasons for their relocation to the area. Two questions asked about connectedness to community. Participants were asked

whether they considered themselves to be part of their local community and whether they considered themselves to be a “local” or an “incomer.” There were also categorical questions related to smoking, drinking alcohol and perception of good health. These questions simply required a ‘yes’ or ‘no’ response. A number of questions asked about present health concerns. Participants were asked to list the health conditions they were currently seeing a doctor for in order that these could be summed. They were also asked whether they were currently taking medication for long-term conditions and how many medications they were taking at the time.

5.4 Ethical Approval

This study was submitted to the West of Scotland Research Ethics Committee for ethical review and to the NHSDG Research and Development Support Unit for management approval. Ethical approval was granted following acknowledgement that all ethical considerations had been adequately addressed in the research protocol. NHSDG management approval was granted following ethical approval. (Please refer to Appendices 4 for appropriate documentation.)

5.5 Power Calculation

A power calculation was conducted to establish the number of participants required to reliably detect any effects in the data should they exist. In order to test the relationship between the various predictors (gender, age, marital status, self rated health, medication for long-term conditions, number of conditions seeing a doctor for, number of current medications, MSPSS significant other subscale, MSPSS family subscale, MSPSS friends subscale, spousal relationship quality, social

network size, the psychosocial loss domain of the AAQ, the physical change domain of the AAQ, the psychological growth domain of the AAQ, total number of life events and relocation status) and psychological health (as measured by HADS, WHOQOL-BREF and CORE-OM), multiple regression analysis was undertaken. Independent *t*-tests were also conducted in order to establish whether groups differed. However, as multiple regression requires greater sample sizes than independent *t*-tests, sample size estimations were calculated based on the regression analysis.

The widely used “rules of thumb” for estimating the minimum number of participants required to conduct multiple regression were devised by Green (1991). Green (1991) found “some support” for the use of these rules of thumb, which state that for the multiple correlation (the testing of the full regression model) the sample size should be no smaller than $50+8k$ (k signifies the number of predictors) and for partial correlations (the testing of the individual predictors), the sample size should equal or exceed $104+k$. Furthermore, Green (1991) suggests that both calculations be conducted and the largest sample size selected, when both the multiple and partial correlations are of interest. In this study, there are seventeen potential predictor variables (as listed above) and hence the sample size estimates based on Green’s equations are 186 and 121, respectively.

However, these “rules of thumb” have been criticised for being over simplistic and failing to account for effect size (Miles & Shevlin, 2001). Therefore, as the “calculations required for power analysis are complex and ... rarely attempted by

hand,” (Miles & Shevlin, 2001, pp.121), the anticipated effect size (.15), desired statistical power level (.8) (Cohen, 1992) and significance level (.05) were entered into an online power calculator⁴ that calculated a minimum sample size estimate of 146. This estimate is in line with the figures presented by Miles & Shelvin (2001) in their graphical representations of sample size estimations. Therefore, in order to test the hypotheses, the study aimed to recruit 146 participants, with 196 participants actually recruited.

5.6 Missing data

Missing data was managed in line with the following recommendations from scale authors or publishers. GL Assessment⁵, the publisher of the HADS, recommends that the score for a missing item on a subscale is substituted with the mean of the remaining six questions. Furthermore, if more than one item is missing on a subscale then it must be considered invalid. For the CORE-OM, the authors recommend prorating for up to three missing items, when calculating the total score (Barkham *et al.*, 2005; Connell *et al.*, 2007; Evans *et al.*, 2003). In order to do this, the mean of the remaining items is taken as the total. When more than three items from the CORE-OM were missing, questionnaires were judged as being invalid.

The WHOQOL Group has specified that the WHOQOL-BREF can be scored when there is up to 20 per cent missing data (Skevington, Lotfy, & O'Connell, 2004). For

⁴ Online power calculation was conducted using <http://danielsoper.com/statcalc3/calc.aspx?id=1>.

⁵ <http://www.gl-assessment.co.uk/products/hospital-anxiety-and-depression-scale/hospital-anxiety-and-depression-scale-faqs#FAQ4>. Retrieved May 2012.

the physical health, psychological health and environment domains, this equates to two missing items and for the social relationships domain it equates to one missing item. In cases of missing data, the missing items are substituted with the mean of the remaining items in that domain. For all other scales (AAQ, MSPSS and spousal relationship quality questions), scales or subscales were considered invalid where one or more item was missing.

6.0 Journal Article

Psychological Health of Retirees in Rural Scotland

Anna Graham, MA

Department of Psychological Services and Research, NHS

Dr Ken Laidlaw, PhD

Clinical Psychology, School of Health in Social Science, University of Edinburgh

Dr John Higgon, D.Clin.Psych

Department of Psychological Services and Research, NHS

*This review has been written in accordance with the author guidelines of
International Psychogeriatrics (Appendix 5)*

6.1 Abstract

Background: In order to aid effective assessment and detection of psychological health, a clear understanding of the risk factors for disturbance is required. This study was undertaken to test the hypothesis that demographic factors, health factors, social factors, attitudes to ageing, number of life events in the last year and relocation status would each significantly account for, and contribute to, the variance in psychological health.

Method: The study employed a cross-sectional design in which 1,080 individuals over the age of 55 were randomly drawn from the community health index (CHI) of a rural health board in Scotland and invited to participate in the study. One hundred and ninety-six respondents completed questionnaires assessing psychological health and a range of potential predictors.

Results: Overall, negative attitudes to ageing were the most prominent predictors of poor psychological health. Psychosocial loss was the only variable found to be a predictor of all seven outcome variables, including anxiety and depression, physical, psychological, social, and environmental quality of life, and general psychological and social functioning. Other predictors included a higher number of life events, poor social support from friends, poor self-rated health and not having a spouse/partner.

Conclusions: Attitudes to ageing appear to play a significant role in the psychological health of older adults. Promoting positive perceptions of ageing in society may potentially pay dividends in the prevention of emotional distress in later life. Psychological interventions, such as cognitive behaviour therapy (CBT), may be key to addressing negative attitudes to ageing at an individual level.

Keywords: depression, anxiety, quality of life, older adult, risk factor, community, attitudes to ageing

6.2 Introduction

Consistent with global demographic trends, the UK is experiencing a profound ageing of the population, with individuals living longer and healthier lives than previous cohorts (Laidlaw and Pachana, 2009). Indeed the pattern of health and illness is also changing, with an increasing number of older adults suffering from long term health conditions (Loretto and Taylor, 2007). Furthermore, chronic mental health difficulties, in particular depression, may go undetected in older adults (Baldwin, 2000).

The prevalence of major depression in community dwelling older adults is estimated to range from 0.9 to 9.4 per cent whereas depressive symptoms range from 7.2 to 49 per cent (Djernes, 2006). Similarly, the prevalence of anxiety disorders amongst older adults in the community is estimated at between 1.2 and 15 per cent with prevalence of anxiety symptoms much higher at between 15 and 52.3 per cent (Bryant *et al.*, 2008). The detection and treatment of anxiety and depressive disorders in older adults has therefore become a priority for health care providers (e.g. Department of Health, 2009).

In order to aid effective assessment and detection of poor psychological health, including depression and anxiety, a clear understanding of the risk factors is required. This study was therefore undertaken to test the hypothesis that

demographic factors (gender, age, marital status), health factors (self-rated health, current medication for long-term conditions, number of conditions seeing a doctor for and number of prescribed medications), social factors (social network size, social support and spousal relationship quality), attitudes to ageing, number of life events in the last year and relocation status (relocater versus non-relocater) would each significantly account for, and contribute to, the variance in psychological health (as measured by the HADS, WHOQOL-BREF and CORE-OM).

6.3 Method

6.3.1 Study design and participants

The present analyses are based on data gathered as part of a doctoral thesis examining the difference between the psychological health of retired relocaters and non-relocaters in rural Scotland. The data reported upon here is based on this sample as a whole. The study employed a cross-sectional design in which 1,080 individuals were randomly drawn from the community health index (CHI) in a rural health board in the south of Scotland by the Public Health Department and were invited to participate in the study by letter. Included in the invitation pack were an information sheet and a questionnaire booklet that participants were instructed to complete and return in the pre-paid envelope if they met the inclusion criteria.

Inclusion criteria for participants were as follows: (1) fifty-five years or older, (2) retired⁶ at or after the age of fifty-five, (3) community dwelling (not residing in nursing or residential care), (4) ability to complete the questionnaires unaided, (5) residing at a postcode assigned to the region. An additional inclusion criterion separated the relocated group and the non-relocated group. Relocaters had to have relocated to the region within the last five years (6a). Non-relocaters had to have resided in the region for at least twenty years (6b).

As the CHI contains the individual's date of birth, the sample were all within the appropriate age range. In addition, the addresses of potential participants were cross-checked against the postcodes of nursing and care homes within the region prior to

⁶ An open criteria for "retirement" was used which included identification with any of the following: self perception as retired, main income altered from wages to pension based funds, significantly reduced working hours to less than half time previous hours.

mailing, thereby reducing the risk of packs being sent to non-community dwelling individuals. Furthermore, the date of first registration with any GP within the region was taken as an indicator of residency length within the region. Whilst this was accurate in most cases, some participants indicated that they had lived in the area for longer than five years but less than twenty years, and these individuals were excluded from the analysis. In addition, due to the absence of a centralised register of retirement status, a number of individuals who were sent packs would not have been retired. Therefore, despite the best efforts of the researcher, not all individuals who received an information and questionnaire pack were eligible to participate.

One hundred and ninety-six individuals returned completed and eligible questionnaires (see Table 6.1 for detailed information on the characteristics of the sample). This equates to an 18.1 per cent response rate. The sample consisted of 109 relocaters (Group 1) and 87 non-relocaters (Group 2). Overall, there were 96 males (49.5 per cent) and 98 females (50.5 per cent), with a mean age of 70 years (SD 7.7, range 56-99). Seventy per cent of the sample were married or living as married and 85 per cent considered themselves to be in good health, with 69 per cent taking medications for long-term health conditions. Less than eight per cent of the sample were smokers, and 69 per cent reported drinking alcohol.

Table 6.1 Characteristics of sample

Characteristic		Mean (<i>n</i> =196 ⁷)	SD
Age of participants		70.07	7.99
Length of retirement (years)		9.63	7.54
Retirement age		60.44	3.57
Length of residency in region (years)		25.69	28.56
Number of physical illnesses		0.93	1.03
Number of current prescribed medications		2.85	2.71
		<i>n</i>	%
<i>Gender</i>	Male	96	49.2
	Female	99	50.8
<i>Age Category</i>	Young-Old (≤ 74 yrs)	141	71.9
	Oldest-Old (≥ 75 yrs)	55	28.1
<i>Relocation status</i>	Relocater (resident < 5 years)	109	55.6
	Non-relocater (resident > 20 years)	87	44.4
<i>Marital Status</i>	Married/Living as married	137	69.9
	Widowed/Single/ Divorced/Separated	59	30.1
<i>Working Role</i>	Professional	64	33.0
	Managerial/Technical	35	18.0
	Skilled non-manual	21	10.8
	Skilled manual	35	18.0
	Partly Skilled	21	10.8
	Unskilled/Other (including homemaker)	18	9.3
<i>Worked in region before retirement</i>	Yes	75	38.5
	No	120	61.5
<i>Do you consider yourself part of local community?</i>	Yes	161	82.6
	No	34	17.4
<i>Do you consider yourself to be a “local” or an “incomer”?</i>		89	45.9
		Local	
		Incomer	
<i>Do you drink alcohol?</i>	Yes	133	68.9
	No	60	31.1
<i>Do you smoke?</i>	Yes	15	7.7
	No	180	92.3
<i>Do you take medication for long-term health conditions?</i>	Yes	133	68.9
	No	60	31.1
<i>Do you consider yourself to be in good health?</i>	Yes	162	85.3
	No	28	14.7

⁷ Sample sizes varied slightly due to a small amount of missing data

6.3.2 Outcomes of interest

The outcome of interest in this study was psychological health. This broad concept was determined using a range of self-report measures. Anxiety and depression symptoms were assessed using the Hospital Anxiety and Depression Scale (HADS, Zigmond and Snaith, 1983), validated for use with older adults (Spinhoven *et al.*, 1997). It is a 14-item questionnaire containing two subscales, one relating to symptoms of anxiety and the other relating to symptoms of depression. Scores range from 0-21 for each subscale, with higher scores indicating more severe symptomatology.

Quality of life was assessed using the WHOQOL-BREF (The WHOQOL Group, 1998), which has also been validated for use with older adults (Hwang *et al.*, 2003). It is a 26-item questionnaire containing four domains and two stand-alone questions. The four domains, physical health, psychological health, social relationships and environment were used in the current study. Scores are transformed to a 0-100 scale, with higher scores denoting higher quality of life.

General well-being and functioning was assessed using the Clinical Outcomes in Routine Evaluation – Outcome Measure (CORE-OM, Evans *et al.*, 2000), which again has been validated for use with older adults (Barkham *et al.*, 2005). Barkham *et al.* (2005) found the subscales (well-being, functioning, problems/symptoms, and risk) to have poorer reliability when analysed separately and therefore advised the use of the overall total with older adults. It is a 34-item measure and the total score is calculated as a mean, ranging from 0-4.

6.3.3 Other study measures

Participants provided a range of demographic information as displayed in Table 6.1. The Attitudes to Ageing Questionnaire (AAQ; Laidlaw *et al.*, 2007) was also administered. The AAQ is a 24-item self-report measure that assesses the subjective experience of ageing at an individual level and the perception of attitudes towards ageing at a societal level. It has three domains, psychosocial loss, psychological growth and physical change. It was designed specifically for use within this population and has strong psychometric properties (Laidlaw *et al.*, 2007). The score on the Psychosocial Loss subscale of the AAQ was reversed in order to align it to the other two, positively worded subscales. As such, an increase in score on psychosocial loss in fact denotes an improvement, or reduction in psychosocial loss.

The number of life events participants had experienced was assessed using the Geriatric Adverse Life Events Scale (GALES; Devanand *et al.*, 2002). This scale was presented to participants as a list of 26 events and they were directed to indicate which had occurred in the last year.

Social support was assessed using the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet *et al.*, 1988), which is a 12-item self-report measure of subjective social support that contains three subscales related to emotional and instrumental support from family, friends and a significant other. This scale has been validated for use with older adults (Stanley *et al.*, 1998). Social network size was assessed using a widely used technique known as the Hierarchical Mapping Technique (HMT; Antonucci, 1986). The HMT is made up of four concentric circles upon which the participant is directed to write the initials of individuals who are

within their social network, with social network size being determined by the total number of names. In addition, spousal relationship quality was assessed using a seven-item scale used by Antonucci and colleagues (Antonucci *et al.*, 2001), which measures positive and negative aspects of a relationship. Whilst the HMT and spousal relationship questions have not been validated for use within the older adult population, they were selected due to their relatively brief administration compared to the alternatives available.

6.3.4 Ethical approval

Ethical approval for this project was granted by the West of Scotland Research Ethics Committee and management approval was granted by the NHS Research and Development Support Unit for the region.

6.3.5 Power Calculation

A power calculation was conducted to establish the number of participants required to reliably detect any effects in the data should they exist. The “rules of thumb” often used to calculate power have been criticised for being simplistic and failing to account for effect size (Miles and Shevlin, 2001). Therefore, as the “calculations required for power analysis are complex and ... rarely attempted by hand,” (Miles and Shevlin, 2001, pp.121), the anticipated effect size (.15), desired statistical power level (.8) and significance level (.05) were entered into an online calculator (<http://danielsoper.com/statcalc3/calc.aspx?id=1>) that calculated a minimum sample size estimate of 146. This estimate is in line with the figures presented by Miles & Shelvin (2001) in their graphical representations of sample size estimations.

Therefore, in order to test the hypotheses, the study aimed to recruit 146 participants, with 196 participants actually recruited.

6.3.5 Statistical analysis

Data were managed and analysed using IBM SPSS Version 19.0. Missing data was managed according to the authors or publishers of the primary outcome variables. GL Assessment⁸, the publisher of the HADS, recommends that the score for a missing item on a subscale is substituted with the mean of the remaining six questions. Furthermore, if more than one item is missing on a subscale then it must be considered invalid. For the CORE-OM, the authors recommend pro-rating for up to three missing items, when calculating the total score (Barkham *et al.*, 2005; Connell *et al.*, 2007; Evans *et al.*, 2003). The WHOQOL Group have specified that the WHOQOL-BREF can be scored when there is up to 20 per cent missing data (Skevington *et al.*, 2004). The other study measures (AAQ, MSPSS and spousal relationship questions) were deemed invalid if one or more items were missing, with the exception of the HMT and GALES, as these measures use sum totals of names or life events.

These guidelines resulted in the following exclusions from the analyses: two participants' HADS-Anxiety scores (1.0 per cent), two participants' WHOQOL-BREF physical domain scores (1.0 per cent), two participants' WHOQOL-BREF psychological domain scores (1.0 per cent), three participants' WHOQOL-BREF

⁸ <http://www.gl-assessment.co.uk/products/hospital-anxiety-and-depression-scale/hospital-anxiety-and-depression-scale-faqs#FAQ4>. Retrieved May 2012.

social domain scores (1.5 per cent), two participants' WHOQOL-BREF environment domain scores (1.0 per cent) and four participants' CORE-OM scores (2.0 per cent).

Descriptive analyses of the primary outcome variables were performed to test distributional assumptions for the proposed parametric analyses. Based upon review of relevant literature pertaining to this issue, the following variables were considered to be potential predictors of psychological health (as measured by HADS-Anxiety, HADS-Depression, WHOQOL-BREF domains and CORE-OM Total score):

1. Demographic factors included *gender, age and marital status*
2. Health factors included *self-rated health, current medication for long-term conditions, number of conditions consulting a doctor for and number of prescribed medications*
3. Social factors included *social network size, spousal relationship quality and social support (as measured by the three subscale of the MSPSS)*
4. Attitudes to ageing included the three domains of the AAQ, *psychosocial loss, psychological growth and physical change*
5. *Number of life events in the last year*
6. *Relocation status* (relocater versus non-relocater)

Pearson correlations were conducted to assess the relationship between these predictor variables and the measures of psychological health in order to establish which variables could be entered into the multiple regression models. As multiple correlations were being conducted on each of the primary outcome variables, a

Bonferroni correction was applied, resulting in adjusted alpha levels of .003 per test (.05/17). Variables that correlated significantly with a primary outcome measure were entered into the appropriate regression model using the forced entry method (Type III sums of squares). Statistical diagnostic analyses showed an acceptable error rate and the assumptions of no perfect multicollinearity, no homoscedasticity and the presence of normally distributed residuals were all upheld.

6.4 Results

Means and standard deviations of the primary outcome variables are summarised in Table 6.2. The correlations between these outcome measures are displayed in Appendix 8. The regression models for each outcome variable are summarised in Table 6.3 and interpretation of these results is detailed below.

Table 6.2 Means and standard deviations of primary outcome variables and other outcomes measures

Primary outcome variable	<i>n</i>	Mean	SD
HADS			
Anxiety	194	4.89	3.59
Depression	196	3.54	2.99
WHOQOL-BREF			
Physical health domain	194	66.04	14.94
Psychological domain	194	68.10	13.30
Social relationships domain	193	71.24	18.80
Environmental domain	194	80.12	14.45
CORE-OM			
CORE-OM Total	192	0.49	0.41
Other outcome measures	<i>n</i>	Mean	SD
AAQ			
Psychosocial loss domain	192	32.33	5.53
Psychological growth domain	192	27.39	4.49
Physical change domain	189	27.17	5.34
MSPSS			
Significant other subscale	193	24.63	5.86
Family subscale	191	22.92	5.98
Friends subscale	191	21.55	5.45
Spousal Relationship Questionnaire	137	12.21	7.62
HMT	191	20.76	23.53
GALES	193	2.07	2.48

Table 6.3 Summary of multiple regression analyses predicting psychological health

Outcome variable	Significant Predictor	β	t	df	R^2	F
HADS-Anxiety	Psychosocial loss (AAQ)	-.323	4.644***	(3, 184)	.254	20.901***
	Number of life events	.241	3.722***			
HADS-Depression	Psychological growth (AAQ)	-.176	2.554*	(6, 168)	.518	30.072***
	Psychosocial loss (AAQ)	-.572	9.645***			
	Psychological growth (AAQ)	-.141	2.195*			
WHOQOL-BREF Physical health	Self-rated health	-.133	2.016*	(7, 170)	.368	14.157***
	Self-rated health	.316	4.057***			
	Psychosocial loss (AAQ)	.205	3.008**			
WHOQOL-BREF Psychological	Physical change (AAQ)	.199	2.751**	(6, 174)	.404	19.678***
	Psychosocial loss (AAQ)	.408	6.238***			
WHOQOL-BREF Social	Psychological growth (AAQ)	.164	2.324*	(9, 114)	.453	10.485***
	Friends subscale (MSPSS)	.410	4.394***			
WHOQOL-BREF Environment	Number of life events	-.233	3.076**	(8, 168)	.488	20.033***
	Psychosocial loss (AAQ)	.198	2.642**			
	Psychosocial loss (AAQ)	.381	5.936***			
	Number of life events	-.242	4.115***			
CORE-OM Total	Self-rated health	.187	2.650**	(10, 112)	.304	4.896***
	Marital status	-.120	2.032*			
	Psychosocial loss (AAQ)	-.244	2.856**			
	Number of life events	.192	2.174*			

* $p < .05$, ** $p < .01$, *** $p < .001$

6.4.1 HADS-Anxiety

The standardised beta coefficient for psychosocial loss indicates that as the score on psychosocial loss increased by one standard deviation (5.505 points on scale), HADS-Anxiety score decreased by 0.323 standard deviations (1.160 points on scale), meaning that more positive attitudes in relation to psychosocial loss are associated with lower levels of anxiety. The standardised beta coefficient for number of life events indicates that as number of life events increase by one standard deviation (2.495 life events), HADS-Anxiety score increases by 0.241 standard deviations (0.865 points on scale). As psychological growth increased by one standard deviation (4.489 points on scale), HADS-Anxiety score decreased by 0.176 standard deviations (0.632 points on scale).

6.4.2 HADS-Depression

The standardised beta coefficient for psychosocial loss indicates that as the psychosocial loss score increases by one standard deviation (5.426 points on scale), HADS-Depression decreases by 0.572 standard deviations (1.684 points on scale). The standardised beta coefficient for the psychological growth domain of the AAQ indicates that as psychological growth increases by one standard deviation (4.479 points on scale), HADS-Depression decreases by 0.141 standard deviations (0.415 points on scale). As self-rated health was a dichotomous variable, the unstandardised beta coefficient is more easily interpreted ($b = -1.132$). It indicates that individuals who did not consider their health to be good scored 1.132 points higher on HADS-Depression.

6.4.3 WHOQOL-BREF Physical domain

As above, the unstandardised beta for self-rated health is more easily interpretable for this variable, $b = 13.430$, and indicates that individuals who considered their health to be good scored 13.430 points higher on the WHOQOL-BREF Physical domain, suggestive of better quality of life. The standardised beta coefficient for psychosocial loss indicates that for each standard deviation increase in psychosocial loss score (5.478 points on scale), the score on the Physical domain of the WHOQOL-BREF increased by 0.205 standard deviations (3.038 points on scale). Similarly, as the score on the physical change subscale (AAQ) increased by one standard deviation (5.342 points on scale), the Physical domain of the WHOQOL-BREF increased by 0.199 standard deviations (2.949 points on scale).

6.4.4 WHOQOL-BREF Psychological domain

The standardised beta coefficients for psychosocial loss indicates that with a standard deviation increase in psychosocial loss score (5.416 points on scale), the score on the Psychological domain of the WHOQOL-BREF increased by 0.408 standard deviations (5.331 points on scale). Similarly, as psychological growth increased by one standard deviation (4.474 points on the scale), WHOQOL-BREF Psychological domain increased by 0.164 standard deviations (2.143 points on scale).

6.4.5 WHOQOL-BREF Social domain

For each standard deviation increase on the friends subscale of the MSPSS (5.471 points no scale), there was a 0.410 standard deviation increase (7.113 points on scale) on the WHOQOL-BREF Social domain. With an increase of one standard

deviation of number of life events (1.975 life events), WHOQOL-BREF Social domain score decreased by 0.233 standard deviations (4.042 points on scale). As psychosocial loss score increased by one standard deviation (4.486 points on scale), WHOQOL-BREF Social domain increased by 0.198 standard deviations (3.435 points on scale).

6.4.6 WHOQOL-BREF Environment domain

As psychosocial loss score increased by one standard deviation (5.477 points on scale), WHOQOL-BREF Environment domain score increased by 0.381 standard deviations (5.539 points on the scale). An increase of one standard deviation in number of life events (2.527 life events) predicted a decrease in WHOQOL-BREF Environment domain score of 0.242 standard deviations (3.518 points on scale). As above, the unstandardised beta for self-rated health is more easily interpretable for this variable, $b = 7.771$, and indicates that individuals who considered their health to be good scored 7.771 points higher on WHOQOL-BREF Environment domain, suggesting better quality of life. Marital status was also coded as a dichotomous categorical variable ($b = -3.763$) and this value indicates that for individuals who are widowed, single, separated or divorced, WHOQOL-BREF Environment score decreases by 3.763 points compared to those who are married or living as married.

6.4.7 CORE-OM Total

As psychosocial loss score increased by one standard deviation (4.504), CORE-OM Total score decreased by 0.244 standard deviations (0.087). For each increase of one

standard deviation in life events (1.977 life events), the model predicts an increase of 0.192 standard deviations in CORE-OM Total score (0.068 points on scale).

6.5 Discussion

6.5.1 Discussion of findings

This study was concerned with accounting for the variance in psychological health within a sample of older adults in rural Scotland. Overwhelmingly, the predictors identified most frequently as contributing to the variance in the measures of psychological health were individuals' attitudes to ageing and those relating to psychosocial loss in particular. It has been proposed by Levy (2003) that a negative perception of older age is developed early in childhood, and confirmed through the experience and selective cognitive processing of decades of life. Levy (2003) explains that this process of internalisation of age stereotype occurs when individuals reach old age, whereupon they become negative self-stereotypes.

Developing this work further, Laidlaw (2010) has suggested that certain events in later life may trigger these self-stereotypes of ageing in a manner akin to the stress-diathesis model. Laidlaw (2010) purports that the perception of negative experiences associated with ageing, such as physical changes, can act as a stressor that prompts the diathesis, or latent vulnerability, to view oneself according to negative stereotypes of ageing. Evidence suggests that this phenomenon is not limited to those in western cultures but is also found amongst eastern cultures, where filial piety demands a respect and deference towards one's elders. For example, a recent study found Chinese older adults to hold attitudes to ageing that are comparable with, or more negative than their British counterparts (Laidlaw *et al.*, 2010).

As the development of a specific measure of personal experience of ageing and perceptions of societal attitudes to ageing (the AAQ) is a recent addition to the research field, the literature in this area is limited (Laidlaw *et al.*, 2007). However, recent research provides additional support for a link between attitudes to ageing and anxiety. Bryant *et al.* (2012) conducted a study with 421 older adults in Australia and reported an association between more positive attitudes to ageing and lower levels of anxiety. The current study replicated these findings, and in particular showed a relationship between anxiety and two domains of the AAQ, psychosocial loss and psychological growth. Higher levels of psychological growth were associated with lower anxiety, suggesting that those who feel they have an increasing ability to effectively cope with life, are less likely to be troubled by anxiety and worry. This relationship bears out in clinical practice, where clinicians observe that individuals who feel they lack the capabilities to navigate novel circumstances are those troubled by anxiety disorders.

In addition, the small number of studies that have investigated the association between attitudes to ageing and depression have found that older adults with major depression or subsyndromal depressive symptoms report more negative attitudes to ageing (Chachamovich *et al.*, 2008). Conversely, more positive attitudes to ageing are associated with lower levels of depressive symptoms (Bryant *et al.*, 2012). These results are in line with those reported in the current study, which found psychosocial loss and psychological growth to be related to depressive symptoms. These two domains combine to present a picture of increasing loss and decreasing ability to

cope with life, self-attributes that are frequently reported in clinic by those with depression.

It would appear that the current study is the first to assess the predictive power of attitudes to ageing in relation to quality of life directly. However Bryant *et al.* (2012) reported an association between attitudes to ageing and satisfaction with life, a concept closely tied to quality of life (Shin and Johnson, 1978). As in the present study, lower levels of psychosocial loss were associated with better outcomes on the quality of life measure in this Australian sample. It is possible that, as an affectively linked domain, attitudes to ageing are more positive in individuals who are enjoying a better quality of life. Moreover, those individuals with a higher quality of life, may have experienced fewer negative incidents that could be attributed to old age, thereby protecting them from internalising negative self-stereotypes of ageing.

The relationship between attitudes to ageing and scores on the CORE-OM has not been directly examined in the past, however Quinn, Laidlaw & Murray (2009) found that, in a sample of 74 older adults in Scotland, individuals endorsing more negative attitudes to ageing reported lower subjective well-being, which is a component domain of the CORE-OM. In the current study higher scores on the psychosocial loss domain were predictive of poorer scores on the CORE-OM. As a measure of social functioning, well-being, problem severity and risk, this association between psychosocial loss and CORE-OM score suggests that poorer attitudes to psychosocial loss are associated with poorer psychological functioning in general.

Based on the current findings, health and social care providers can be vigilant for the following risk factors for poor psychological health in older adults: higher numbers of adverse life events in the previous year, a lack of perceived social support from friends, poor self-rated health, being unmarried or without a partner, and having poorer attitudes to ageing. At the present time, despite the availability of evidenced based treatments for depression in older adults (Wilson *et al.*, 2008), this age group proportionately underutilises mental health services (Crabb and Hunsley, 2006). In some countries, such as Canada, the attitudes of older adults towards seeking support from mental health services have been shown in the literature to be favourable (Mackenzie *et al.*, 2008).

However, there is further evidence to suggest that these attitudes vary cross-culturally (Jang *et al.*, 2009; Conner *et al.*, 2010) and it is possible that this underutilisation can least partially attributed to these attitudes. Furthermore, older adults regard psychotherapy and pharmacological treatments for depression as effective and acceptable but view psychotherapy as having significantly less chance of unwanted side-effects (Kuruvilla *et al.*, 2006). When given a choice of treatment options, older adults with depression have a preference for psychotherapy over pharmacological treatments, yet only a minority receive this (Unützer *et al.*, 2003). Therefore, professionals working with older adults must be alert to their own beliefs surrounding the justifiability and understandability of depression (Burroughs *et al.*, 2006), which may hinder appropriate diagnosis and treatment of this condition. In addition, mental health services need to be designed so as to effectively offer

evidenced based and acceptable methods of treatment for anxiety and depression in older adults.

This study also sought to identify modifiable risk factors for poor psychological health. Overwhelmingly the most prominent and modifiable predictors were attitudes to ageing. Cognitive behaviour therapy (CBT) offers particular promise in terms of addressing these attitudes. Bryant *et al.* (2012) describe attitudes as “beliefs that have an evaluative component,” (pp.1). Unhelpful beliefs, or dysfunctional cognitive distortions, are a key focus in CBT and therapy aims to teach individuals to identify and challenge these negative automatic cognitions (Clark *et al.*, 1999). In addition, there is a body of work that sets out how therapists might effectively address and challenge negative self-stereotypes of ageing in order to improve psychological health. Laidlaw, Thompson & Gallagher-Thompson, (2004) have developed a comprehensive and therapeutically applicable conceptual framework for depression in older adults. Based on the established CBT model of depression (e.g. Clark *et al.*, 1999), this framework incorporates additional domains including the socio-cultural context of attitudes to ageing.

6.5.1 Limitations

The large sample size and use of contemporary, psychometrically robust measures of attitudes and quality of life are relative strengths of this study. However a number of limitations must be acknowledged. Firstly, the response rate was lower than desired, at 18.1 per cent, and may limit the generalisability of the findings. It is possible that the participating individuals may have been more confident in engaging with written

material or had fewer caring responsibilities to contend with, meaning the sample may be unrepresentative of those with poor literacy or those caring for a spouse or family member. However, a random sample of community dwelling older adults were invited to participate and this recruitment method is considered superior to the opportunistic sampling sometimes employed by researchers. In addition, the use of self-report measures that were not completed in the presence of the researcher may have resulted in misunderstandings, in particular, with regards to the different time periods in question in the different questionnaires. This method of data collection was chosen in order to gather a large sample set and to remove the impact of experimenter bias.

6.5.2 Conclusions

The factors found to predict better psychological health were many and varied, with significant influence exerted by attitudes to ageing. In line with previous research, the current findings suggest that attitudes to ageing play a crucial role in well-being and psychological health in later life. It is therefore imperative that clinicians address these attitudes at an individual level in therapy and that policy makers find ways to promote positive attitudes to ageing at a societal level in order to support current and future generations of older adults to age successfully.

6.7 References

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7.0 Results

7.1 Overview of Analysis

The first hypothesis of the current study was that there would be statistically significant differences between relocaters and non-relocaters with regards to psychological health, as measured by scores on the HADS, WHOQOL-BREF and CORE-OM. For this analysis, *t*-tests were run and effect sizes (*d*) were calculated. Due to multiple comparisons being made, Bonferroni corrections were applied.

The second hypothesis of this study was that there would be a significant difference between individuals who considered themselves to be “locals” and those who considered themselves to be “incomers,” with regard to the same measures of psychological health as above. This second hypothesis was based on a participant’s own ratings of themselves as either a “local” or an “incomer” and was therefore independent of the researcher’s categorisation of individuals into relocater and non-relocater groups, as in the first hypothesis. Again, *t*-tests were used for this analysis, effect sizes were calculated and Bonferroni corrections were applied.

The final hypothesis of this study was that demographic factors (gender, age, marital status), health factors (self-rated health, current medication for long-term conditions, number of conditions seeing a doctor for, number of prescribed medications), social factors (social network size, social support, spousal relationship quality), attitudes to ageing, number of life events in the last year and relocation status (relocater versus non-relocater) would each significantly account for, and contribute to, the variance in

psychological health (as measured by the same primary outcome variables as above) in the sample as a whole.

7.2 Exploratory Analysis

Prior to statistical analysis being conducted, the primary outcome variables were assessed with regards to the assumptions of parametric analysis, namely normality and homogeneity. Kolmogorov-Smirnov tests are often conducted to assess the normality of the distribution. However, in large samples this test is likely to lead the researcher to reject the hypothesis of normality “even though minor deviations from normality will not be a problem” (Howell, 2010, pp.79). Consequently, skewness and kurtosis were evaluated visually, using histograms, and statistically using *z*-scores (Appendix 6). From examination of the histograms, it was concluded that the frequency distributions closely approximated the normal distribution. Whilst the skewness and kurtosis statistics reflected that some of the distributions did contain a level of skewness and/or kurtosis, large samples, such as the one reported here, will often produce significant values due to small deviations from the normal distribution (Field, 2009).

Outcome variables were also assessed for homogeneity of variance, using Levene’s test. The variances did not differ significantly in the two groups (relocaters and non-relocaters) for most of the primary outcomes variables, with the exception of the physical health domain (WHOQOL-BREF) and CORE-OM total (Appendix 6.3). However, as with the Kolmogorov-Smirnov test, large sample sizes often give rise to significant results even when differences are only very small (Field, 2009). Hartley’s

F_{Max} can be used to assess homogeneity of variance in groups of equal size, however, due to the difference in group size in the current study this was not a viable test to use (Lomax, 2007). Furthermore, the parametric test used in this study, the t -test, is robust in the face of “moderate departures from the underlying assumptions,” (p.215 Howell, D., 2010) so it was decided to proceed cautiously with parametric analyses.

As the data could be considered by some people to violate the assumptions of parametric analysis, the data was transformed as indicated by the shape of the distributions (Tabachnick & Fidell, 1989). When the results of the analysis were completed using the transformed data, the data behaved in a similar fashion to the untransformed data. This was considered further evidence that the data should not be transformed but treated as meeting the assumptions of normality and homogeneity. Therefore the decision was taken to use the untransformed data for all analyses.

In addition to the assumptions of normality and homogeneity, the underlying assumptions of the regression model were also assessed and found to be upheld. These are reported fully below and illustrated in Appendix 7.

7.3 Descriptive Statistics

The mean age of the participants was 70.1 years (SD 7.99), range 56-99 years, with 55 individuals (28.1 per cent) in the Oldest-Old category (over 75 years). There were 96 males (49.2 per cent) and 99 females (50.8 per cent). The majority of the participants were married or living as married (70.3 per cent) and one third had held professional positions during their working career (33.0 per cent). Most participants

reported drinking alcohol (68.9 per cent) and a small minority reported smoking (7.7 per cent). The participants as a whole largely considered themselves to be in good health (85.3 per cent) despite 68.9 per cent taking medication for long-term health conditions, such as cardiac disease, chronic pain and diabetes.

The descriptive statistics for the total sample and the two sub-groups are displayed in Table 7.1. In order to assess the comparability of the two groups in terms of demographic factors, these were compared using *t*-tests, Pearson's chi-square tests and effect size calculations (Cohen's *d* or Cramer's *V* as appropriate) and the results of these tests are also displayed in Table 7.1. Due to the multiple comparisons being conducted, the Bonferroni correction was applied (.05/17) and statistical significance was set at $p < .003$.

Non-relocaters were significantly older ($t(194) = 4.04, p < .003, r = .28$), had been retired for longer ($t(174) = 3.39, p < .003, r = .24$) and were taking a greater number of current medications than relocaters ($t(148) = 4.37, p < .003, r = .31$). A higher percentage of relocaters were married or living as married (86 per cent) compared to non-relocaters (51 per cent; $\chi^2(1) = 9.46, p < .003, V = .22$). As expected, non-relocaters were resident in the area significantly longer than non-relocaters ($t(87) = 24.58, p < .003, r = .88$), were significantly more likely to report having worked in the region prior to retirement ($\chi^2(1) = 144.10, p < .003, V = .86$), to consider themselves part of the local community ($\chi^2(1) = 9.62, p < .003, V = .22$) and to consider themselves to be "locals" rather than "incomers" ($\chi^2(1) = 57.03, p < .003, V = .54$).

However, the mean age of retirement in the relocation group was not significantly different from the mean age of retirement in the non-relocation group. Nor did the two groups differ significantly with regards to the gender distribution, previous working roles, number of physical illnesses, the proportions describing their health as good, smoking, alcohol consumption or the use of medication for long term health conditions (see table 7.1 for full details).

Although there are significant differences between the two groups in terms of age, length of retirement and number of current medications, on the whole these differences resulted in small to moderate effect sizes. Indeed, all of the differences, other than the predicted differences (e.g. length of residency, work in region prior to retirement) are less than .8, which is considered a large effect size when using Cohen's *d* (Cohen, 1988; Cohen, 1992). It is therefore considered that the two groups, relocaters and non-relocaters, are comparable.

Table 7.1 Characteristics of sample

	Total Sample (<i>n</i>=196⁹)		Group 1 Relocators (<i>n</i>=109)		Group 2 Non-relocators (<i>n</i>=87)		Comparison of Group 1 and Group 2		
Characteristic	Mean	SD	Mean	SD	Mean	SD	<i>df</i>	<i>t</i>	<i>d</i> ¹⁰
Age of participants	70.07	7.99	68.08	7.52	72.55	7.91	194	4.04**	0.58
Length of retirement (years)	9.63	7.54	8.02	6.97	11.64	7.78	174	3.39**	0.49
Retirement age	60.44	3.57	60.06	3.55	60.91	3.56	194	1.66	0.24
Length of residency in region (years)	25.69	28.56	2.99	1.39	54.13	19.37	87	24.58**	3.72
Number of physical illnesses	0.93	1.03	0.80	0.94	1.09	1.12	193	2.01*	0.28
Number of current prescribed medications	2.85	2.71	2.10	2.20	3.80	3.01	148	4.37**	0.64
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>df</i>	χ^2	<i>Cramer's V</i>
<i>Gender</i>							1	.590	.06
Male	96	49.2	51	46.8	45	52.3			
Female	99	50.8	58	53.2	41	47.7			
<i>Age Category</i>							1	16.22**	.29
Young-Old (≤ 74 yrs)	141	71.9	91	83.5	50	57.5			
Oldest-Old (≥ 75 yrs)	55	28.1	18	16.5	37	42.5			
<i>Marital Status</i>							1	9.46**	.22
Married/Living as married	137	69.9	86	78.9	51	58.6			
Widowed/Single/Divorced/Separated	59	30.1	23	21.1	36	41.4			
<i>Working Role</i>							5	6.88	.19
Professional	64	33.0	40	37.4	24	27.6			
Managerial/Technical	35	18.0	23	21.5	12	13.8			
Skilled non-manual	21	10.8	9	8.4	12	13.8			
Skilled manual	35	18.0	15	14.0	50	23.0			
Partly Skilled	21	10.8	10	9.3	11	12.6			
Unskilled/ Other (including homemaker)	18	9.3	10	9.3	8	9.2			

⁹ Sample sizes varied slightly due to a small amount of missing data¹⁰ All effect sizes (*d*) was calculated by hand and confirmed using an online effect size calculator <http://www.uccs.edu/~lbecker/>

<i>Worked in region before retirement</i>							1	144.10**	-.86
Yes	75	38.5	1	0.9	74	85.1			
No	120	61.5	107	99.1	13	14.9			
<i>Do you consider yourself part of local community?</i>							1	9.62**	-.22
Yes	161	82.6	81	75.0	80	92.0			
No	34	17.4	27	25.0	7	8.0			
<i>Do you consider yourself to be a "local" or an "incomer"?</i>							1	57.03**	-.54
Local	89	45.9	24	22.0	65	76.5			
Incomer	105	54.1	85	78.0	20	23.5			
<i>Drink alcohol</i>							1	0.95	-.07
Yes	133	68.9	72	66.1	61	72.6			
No	60	31.1	37	33.9	23	27.4			
<i>Smoker</i>							1	0.04	-.02
Yes	15	7.7	8	7.3	7	8.1			
No	180	92.3	101	92.7	79	91.9			
<i>Medication for long-term conditions</i>							1	0.73	-.06
Yes	133	68.9	71	66.4	62	72.1			
No	60	31.1	36	33.6	24	27.9			
<i>Do you consider yourself to be in good health?</i>							1	7.80*	.20
Yes	162	85.3	98	91.6	64	77.1			
No	28	14.7	9	8.4	19	22.9			

** $p < .003$ (Bonferroni correction), * $p < .05$

7.4 Hypothesis one:

There will be a significant difference between relocaters and non-relocaters with regards to psychological health, as measured by scores on the HADS, WHOQOL-BREF and CORE-OM.

There were 109 relocaters and 87 non-relocaters in the sample. Independent *t*-tests were conducted to examine whether these groups differed with regards to their psychological health. The only variable to differ significantly between the groups was the Environmental domain of the WHOQOL-BREF. Relocaters reported higher environmental quality of life ($M = 82.22$, $SD = 13.78$) than non-relocaters ($M = 77.48$, $SD = 14.92$), $t(192) = 2.30$, $p < .05$, $r = .19$. However, when the Bonferroni correction is applied, reducing the alpha level to .007 (.05/7), the statistic is no longer significant (Table 7.2). Consequently, the null hypothesis, that there is no significant difference between relocaters and non-relocaters with regards to psychological health, cannot be rejected. This means that in the current sample, there is insufficient evidence to accept hypothesis one.

Table 7.2 Psychological health of relocaters versus non-relocaters

Outcome variable	Total sample			Group 1 Relocaters			Group 2 Non-relocaters			Comparison of Group 1 and Group 2		
	<i>n</i>	Mean	SD	<i>n</i>	Mean	SD	<i>n</i>	Mean	SD	<i>t</i> (2 tailed)	<i>df</i>	<i>r</i>
HADS												
Anxiety	194	4.89	3.59	109	5.19	3.60	85	4.49	3.56	1.35	192	.10
Depression	196	3.54	2.99	109	3.53	3.05	87	3.54	2.92	0.19	194	.03
WHOQOL-BREF												
Physical health domain	194	66.04	14.94	108	67.91	13.50	86	63.70	16.35	1.93	163	.14
Psychological domain	194	68.10	13.30	108	67.81	13.44	86	68.46	13.20	0.34	192	.02
Social relationships domain	193	71.24	18.80	107	69.70	19.14	86	73.16	18.30	1.27	191	.09
Environmental domain	194	80.12	14.45	108	82.22	13.78	86	77.48	14.92	2.30*	192	.19
CORE-OM												
CORE-OM Total	192	0.49	0.41	109	0.50	0.45	83	0.49	0.34	0.25	190	.04

** $p < .007$ (Bonferroni correction), * $p < .05$

7.5 Hypothesis two:

There will be a significant difference between those who consider themselves to be “locals” and those who consider themselves to be “incomers” with regards to psychological health, as measured by scores on the HADS, WHOQOL-BREF and CORE-OM.

The analysis undertaken for the previous hypothesis utilised the researcher’s definition of relocation. For the second hypothesis, a similar analysis was undertaken using the participants’ perception of themselves as either a “local” or an “incomer.” Seventy-eight per cent of relocaters described themselves as an “incomer,” compared to 23.5 per cent of non-relocaters. In total, there were 89 individuals who identified themselves as “locals” and 105 individuals who identified themselves as “incomers” in the sample. Independent *t*-tests were conducted to examine whether these groups differed with regards to their psychological health. None of the outcome variables differed significantly between these two groups (Table 7.3). Consequently, the null hypothesis, that there is no significant difference between individuals who consider themselves to be “locals” and those who consider themselves to be “incomers” with regards to psychological health, cannot be rejected. This means that in the current sample, there is insufficient evidence to accept hypothesis two.

Table 7.3 Psychological health of “locals” versus “incomers”

Outcome variable	“Locals”			“Incomers”			Comparison of “locals” and “incomers”		
	<i>n</i>	Mean	SD	<i>n</i>	Mean	SD	<i>t</i> (2 tailed)	<i>df</i>	<i>r</i>
HADS									
Anxiety	87	4.66	3.78	105	5.06	3.46	0.77	190	.09
Depression	89	3.39	2.93	105	3.65	3.06	0.59	192	.04
WHOQOL-BREF									
Physical health domain	88	65.13	16.58	104	67.06	13.46	0.89	190	.06
Psychological domain	88	69.03	13.43	104	67.73	13.07	0.68	190	.05
Social relationships domain	88	73.67	17.54	103	69.74	19.46	1.46	189	.11
Environmental domain	88	79.37	15.10	104	81.02	13.74	0.79	190	.06
CORE-OM									
CORE-Total	85	0.47	0.38	105	0.51	0.43	0.60	188	.03

** $p < .007$ (Bonferroni correction), * $p < .05$

7.6 Hypothesis three:

Demographic factors (gender, age, marital status), health factors (self-rated health, current medication for long-term conditions, number of conditions seeing a doctor for, number of prescribed medications), social factors (social network size, spousal relationship quality, social support from family, friends and a significant others), attitudes to ageing, number of life events in the last year, and relocation status (relocater versus non-relocater) would each significantly account for, and contribute to, the variance in psychological health (as measured by the HADS, WHOQOL-BREF and CORE-OM).

Correlational analysis was undertaken to assess the relationship between the predictor variables (demographic factors, health factors, social factors, attitudes to ageing, number of life events in the last year and relocation status) and psychological health (scores on HADS, WHOQOL-BREF, CORE-OM) in order to establish which were suitable variables to be entered into the multiple regression models. As multiple correlations were being conducted on each of the primary outcome variables, a Bonferroni correction was applied, resulting in adjusted alpha levels of .003 per test (.05/17). See Table 7.4 for correlational analysis results.

When conducting multiple regression analysis, it is recommended that one should exclude any pairs of independent variables with bivariate correlations greater than or equal to .7 (Tabachnick & Fidell, 1989) in order to avoid multicollinearity. As none of the independent variables had correlations $\geq .7$, all significant variables were

entered into the multiple regression model. As there are no previous studies, to the researcher's knowledge, using this combination of outcome variables and predictors, the independent variables (predictors) were entered into the regression model using the "Enter" method in SPSS (Type III sums of squares, Field, 2009). In each regression model, the primary outcome variable in question was entered as the dependent variable. The regression models for each outcome variable are summarised in Table 7.5 and interpretation of these results is detailed below. The significant partial correlations (beta coefficients) are detailed before and after the application of a Bonferroni correction. However, the use of this approach has been described as "overly cautious," (Mundfrom *et al.*, 2006, pp.6) and conclusions are therefore based on the unadjusted alpha levels.

Table 7.4 Correlation analysis

Predictors	Primary outcome variables						
	HADS – Anxiety	HADS – Depression	WHOQOL Physical	WHOQOL Psychological	WHOQOL Social	WHOQOL Environment	CORE Total
Gender	.09	.10	.05	.06	.15*	.01	.04
Age	.11	.18*	.14	.14	.03	.12	.00
Marital status	.13	.12	.23**	.21*	.16*	.32**	.25**
Self-rated “good” health	.20*	.30**	.48**	.19*	.24**	.41**	.25**
Current medication for long-term conditions	.02	.12	.21*	.13	.20*	.12	.05
Number of conditions consulting a doctor for	.14*	.14	.26**	.16*	.12	.27**	.18*
Number of current medications	.00	.24**	.29**	.12	.21*	.33**	.13
MSPSS – significant other	.10	.20*	.11	.26**	.32**	.18*	.31**
MSPSS – family	.15*	.19*	.12	.32**	.34**	.10	.28**
MSPSS – friends	.11	.28**	.12	.32**	.47**	.20*	.29**
Spousal relationship quality	.11	.19*	.20*	.20*	.31**	.23*	.32**
Social network size	.01	.19*	.17*	.21*	.15*	.22*	.17*
AAQ – psychosocial loss	.43**	.69**	.41**	.57**	.47**	.58**	.58**
AAQ – physical change	.16*	.40**	.42**	.38**	.27**	.36**	.29**
AAQ – psychological growth	.27**	.42**	.21*	.43**	.36**	.28**	.36**
No of life events	.26**	.20*	.25**	.16*	.32**	.33**	.36**
Relocation status	.10	.00	.14	.02	.09	.16*	.02

** $p < .003$ (Bonferroni correction), * $p < .05$

Table 7.5 Summary of multiple regression analyses predicting psychological health

Outcome variable	Significant Predictor	β	t	df	R^2	F
HADS-Anxiety	Psychosocial loss (AAQ)	-.323	4.644***	(3, 184)	.254	20.901***
	Number of life events	.241	3.722***			
	Psychological growth (AAQ)	-.176	2.554*			
HADS-Depression	Psychosocial loss (AAQ)	-.572	9.645***	(6, 168)	.518	30.072***
	Psychological growth (AAQ)	-.141	2.195*			
	Self-rated health	-.133	2.016*			
WHOQOL-BREF Physical health	Self-rated health	.316	4.057***	(7, 170)	.368	14.157***
	Psychosocial loss (AAQ)	.205	3.008**			
	Physical change (AAQ)	.199	2.751**			
WHOQOL-BREF Psychological	Psychosocial loss (AAQ)	.408	6.238***	(6, 174)	.404	19.678***
	Psychological growth (AAQ)	.164	2.324*			
WHOQOL-BREF Social	Friends subscale (MSPSS)	.410	4.394***	(9, 114)	.453	10.485***
	Number of life events	-.233	3.076**			
	Psychosocial loss (AAQ)	.198	2.642**			
WHOQOL-BREF Environment	Psychosocial loss (AAQ)	.381	5.936***	(8, 168)	.488	20.033***
	Number of life events	-.242	4.115***			
	Self-rated health	.187	2.650**			
	Marital status	-.120	2.032*			
CORE-OM Total	Psychosocial loss (AAQ)	-.244	2.856**	(10, 112)	.304	4.896***
	Number of life events	.192	2.174*			

* $p < .05$, ** $p < .01$, *** $p < .001$ (Please note individual Bonferroni corrections were applied for each model as detailed below.)

7.6.1 HADS-Anxiety

The first outcome variable to be entered into a regression equation was HADS-Anxiety. For this model, number of life events and the psychosocial loss and psychological growth domains of the AAQ were the independent variables entered into the regression equation. These three variables accounted for 25.4 per cent of the variance in HADS-Anxiety scores ($R^2 = .254$, $F(3, 184) = 20.901$, $p < .001$). If a Bonferroni correction was applied to the partial correlations, adjusting the alpha level to .017 (.05/3), these three variables remain predictive of HADS-Anxiety score. The predictor with the largest standardised beta coefficient was the psychosocial loss domain of the AAQ, $\beta = -.323$, $t = 4.644$, $p < .001$. This indicates that as the score on psychosocial loss increased¹¹ by one standard deviation (5.505 points on scale), HADS-Anxiety score decreased by 0.323 standard deviations (1.160 points on scale)¹².

Number of life events had the next largest standardised beta coefficient, $\beta = .241$, $t = 3.722$, $p < .001$. This indicates that as number of life events increased by one standard deviation (2.495 life events), HADS-Anxiety score increased by 0.241 standard deviations (0.865 points on scale). The psychological growth domain of the AAQ had the smallest standardised beta coefficient, $\beta = -.176$, $t = 2.554$, $p < .017$. This indicates that as psychological growth increased by one standard deviation

¹¹ The score on the Psychosocial Loss subscale of the AAQ has been reversed in order to align it to the other two, positively worded subscales. As such, an increase in score on psychosocial loss in fact denotes an improvement, or reduction in psychosocial loss.

¹² For all reported standardised beta coefficients, the interpretations hold true only if the effects of the other predictors in the model are held constant.

(4.489 points on scale), HADS-Anxiety score decreased by 0.176 standard deviations (0.632 points on scale).

Due to the complicated nature of hypothesis three, rejection of the null hypothesis is not straightforward. However, it can be concluded that there is partial evidence in support of hypothesis three. Specifically, psychosocial loss and number of life events each significantly accounted for and contributed to the variance in HADS-Anxiety score. The remaining factors do not significantly account for or contribute to the variance.

7.6.2 HADS-Depression

When HADS-Depression was entered into the regression equation as the dependent variable and self-rated health, number of current medications, the friends subscale of the MSPSS, the psychosocial loss domain, the physical change domain and the psychological growth domain of the AAQ were entered as independent variables, this model accounted for 51.8 per cent of the variation in HADS-Depression scores ($R^2 = .518$, $F(6, 168) = 30.072$, $p < .001$).

The predictor with the largest standardised beta coefficient was the psychosocial loss domain of the AAQ, $\beta = -.572$, $t = 9.645$, $p < .001$. This indicates that as the psychosocial loss score increases by one standard deviation (5.426 points on scale), HADS-Depression decreases by 0.572 standard deviations (1.684 points on scale). The predictor with the next largest standardised beta coefficient was the psychological growth domain of the AAQ, $\beta = -.141$, $t = 2.195$, $p < .05$. This

indicates that as psychological growth increases by one standard deviation (4.479 points on scale), HADS-Depression decreases by 0.141 standard deviations (0.415 points on scale).

Self-rated health was the predictor with the next largest standardised beta coefficient, $\beta = -.133$, $t = 2.016$, $p < .05$. As this was a dichotomous variable, the unstandardised beta coefficient is more easily interpreted ($b = -1.132$). This indicates that individuals who did not consider their health to be good scored 1.132 points higher on HADS-Depression. The other predictors entered into the model were not found to contribute significantly to the model. The standardised beta coefficients of these non-significant predictors were: the friends subscale of the MSPSS, $\beta = -.077$, $t = 1.344$, $p > .05$; the physical change domain of the AAQ, $\beta = -.047$, $t = 0.700$, $p > .05$; number of current medications, $\beta = -.007$, $t = 0.109$, $p > .05$. If a Bonferroni correction was applied to the partial correlations, reducing the alpha level to .008 (.05/6), only psychosocial loss was found to be a predictor of HADS-Depression.

Again, the complexity of hypothesis three means rejection of the null hypothesis is not straightforward. However, it can be concluded that there is partial evidence in support of hypothesis three with regards to HADS-Depression score. Specifically, psychosocial loss, psychological growth and self-rated health each significantly accounted for and contributed to the variance in HADS-Depression score. The remaining factors do not significantly account for or contribute to the variance.

7.6.3 WHOQOL-BREF Physical domain

The next regression model contained the physical health domain of the WHOQOL-BREF as the dependent variable. Marital status, self-rated health, number of conditions consulting a doctor for, number of current medications, number of life events, and the psychosocial loss and physical change domains of the AAQ were entered as the independent variables. This model accounted for 36.8 per cent of the variation in score on the WHOQOL-BREF Physical domain, ($R^2 = .368$, $F(7, 170) = 14.157$, $p < .001$). Three of the predictors made significant contributions to the model. Self-rated health had the largest standardised beta coefficient, $\beta = -.316$, $t = 4.057$, $p < .001$. As above, the unstandardised beta is more easily interpretable for this variable, $b = 13.430$, and indicates that individuals who considered their health to be good scored 13.430 points higher on the WHOQOL-BREF Physical domain, suggestive of better quality of life.

The psychosocial loss domain of the AAQ had the next largest standardised beta coefficient, $\beta = .205$, $t = 3.008$, $p < .01$, indicating that for each standard deviation increase in psychosocial loss score (5.478 points on scale), the score on the physical health domain of the WHOQOL-BREF increased by 0.205 standard deviations (3.038 points on scale). The physical change domain of the AAQ was the other independent variable making a significant contribution to the model, $\beta = .199$, $t = 2.751$, $p < .01$. This means that as the score on the physical change domain of the AAQ increased by one standard deviation (5.342 points on scale), the physical health domain of the WHOQOL-BREF increased by 0.199 standard deviations (2.949 points on scale).

None of the other independent variables made significant contributions to the regression model. The standardised beta coefficients of these variables were: number of life events, $\beta = -.107$, $t = 1.667$, $p > .05$; marital category, $\beta = -.076$, $t = 1.170$, $p > .05$; number of conditions consulting a doctor for, $\beta = -.051$, $t = 0.733$, $p > .05$; number of current medications, $\beta = .018$, $t = 0.246$, $p > .05$. If a Bonferroni correction was applied to the partial correlations, reducing the alpha level to .007 (.05/7), only self-rated health and psychosocial loss were predictive of WHOQOL-BREF Physical domain score.

As above, the rejection of the null hypothesis is not straightforward. However, it can be concluded that there is partial evidence in support of hypothesis three with regards to the physical domain of the WHOQOL-BREF. Specifically, self-rated health, and the psychosocial loss and physical change domains of the AAQ each significantly accounted for and contributed to the variance in scores on the physical domain of the WHOQOL-BREF. The remaining factors do not significantly account for or contribute to the variance.

7.6.4 WHOQOL-BREF Psychological domain

The psychological domain of the WHOQOL-BREF was entered into the regression equation as the dependent variable, with the three subscales of the MSPSS (significant other, family, and friends) and the three subscales of the AAQ (psychosocial loss, physical change, and psychological growth).

This model accounted for 40.4 per cent of the variance in score on the psychological domain of the WHOQOL-BREF, ($R^2 = .404$, $F(6, 174) = 19.678$, $p < .001$). Only two of the independent variables made significant contributions to the model. Psychosocial loss had the larger of the two significant standardised beta coefficients, $\beta = .408$, $t = 6.238$, $p < .001$, indicating that with a standard deviation increase in psychosocial loss score (5.416 points of scale), the score on the psychological domain of the WHOQOL-BREF increased by .408 standard deviations (5.331 points on scale).

The second independent variable making a significant contribution to the model was psychological growth, $\beta = .164$, $t = 2.324$, $p < .05$. This indicates that as psychological growth increased by one standard deviation (4.474 points on the scale), WHOQOL-BREF psychological domain increased by 0.164 standard deviations (2.143 points on scale). None of the other independent variables contributed significantly to the model. The standardised beta coefficients of these variables were: the physical change domain of the AAQ, $\beta = .126$, $t = 1.833$, $p > .05$; the family subscale of the MSPSS, $\beta = .125$, $t = 1.441$, $p > .05$; the friends subscale of the MSPSS, $\beta = .077$, $t = 1.031$, $p > .05$; the significant other subscale of the MSPSS, $\beta = .012$, $t = 0.152$, $p > .05$. If a Bonferroni correction was applied to the partial correlations, reducing the alpha level to .008 (.05/6), only psychosocial loss was found to predict WHOQOL-BREF Psychological domain score.

As above, the rejection of the null hypothesis is not straightforward. However, it can be concluded that there is partial evidence in support of hypothesis three with regards

to the psychological domain of the WHOQOL-BREF. Specifically, psychosocial loss and psychological growth each significantly accounted for and contributed to the variance in scores on the psychological domain of the WHOQOL-BREF. The remaining factors do not significantly account for or contribute to the variance.

7.6.5 WHOQOL-BREF Social domain

When the WHOQOL-BREF social domain was entered into the regression equation as the dependent variable, with self-rated health, the three subscales of the MSPSS (significant other, family, and friends), spousal relationship quality, the three subscales of the AAQ (psychosocial loss, physical change, and psychological growth) and number of life events as the independent variables, this model accounted for 45.3 per cent of the variance in WHOQOL-BREF social domain score, ($R^2 = .453$, $F(9, 114) = 10.485$, $p < .001$).

The friends subscale (MSPSS) was the independent variable with the largest standardised beta coefficient, $\beta = .410$, $t = 4.394$, $p < .001$. This means that for each standard deviation increase on the friends subscale (5.471 points on scale), there was a 0.410 standard deviation increase (7.113 points on scale) on the WHOQOL-BREF Social domain score. Number of life events also made a significant contribution to the regression model, $\beta = -.233$, $t = 3.076$, $p < .01$, indicating that with an increase of one standard deviation of number of life events (1.975 life events), WHOQOL-BREF Social domain score decreased by 0.233 standard deviations (4.042 points on scale).

The psychosocial loss domain of the AAQ was the only other independent variable making a significant contribution to the regression model, $\beta = .198$, $t = 2.642$, $p < .01$. This indicates that as psychosocial loss score increased by one standard deviation (4.486 points on scale), WHOQOL-BREF Social domain increased by 0.198 standard deviations (3.435 points on scale). None of the other independent variables contributed to the model significantly. The standardised beta coefficients of these variables were: spousal relationship quality, $\beta = -.130$, $t = 1.679$, $p > .05$; the psychological growth domain of the AAQ, $\beta = .111$, $t = 1.193$, $p > .05$; self-rated health, $\beta = -.089$, $t = 1.144$, $p > .05$; the family subscale of the MSPSS, $\beta = -.070$, $t = 0.716$, $p > .05$; the significant other subscale of the MSPSS, $\beta = .065$, $t = 0.721$, $p > .05$; the physical change domain of the AAQ, $\beta = .015$, $t = 0.156$, $p > .05$. If a Bonferroni correction was applied to the partial correlations, reducing the alpha level to .006 (.05/9), the friends subscale of the MSPSS and number of life events were the only significant predictors of WHOQOL-BREF Social domain score.

Again, the rejection of the null hypothesis is not straightforward in relation to this outcome measure. However, it can be concluded that there is partial evidence in support of hypothesis three with regards to the social domain of the WHOQOL-BREF. Specifically, the friends subscale of the MSPSS, number of life events and psychosocial loss each significantly accounted for and contributed to the variance in scores on the social domain of the WHOQOL-BREF. The remaining factors do not significantly account for or contribute to the variance.

7.6.6 WHOQOL-BREF Environment domain

The WHOQOL-BREF Environment domain was the next outcome variable to be entered into a regression equation. Marital status, self-rated health, number of conditions consulting a doctor for, number of current medications, the three subscales of the AAQ (psychosocial loss, physical change, and psychological growth) and number of life events were entered as the independent variables. This model accounted for 48.8 per cent of the variance in WHOQOL-BREF Environment domain score, ($R^2 = .488$, $F(8, 168) = 20.033$, $p < .001$).

The psychosocial loss domain of the AAQ was the predictor with the largest beta coefficient, $\beta = .381$, $t = 5.936$, $p < .001$. This indicates that as the score on psychosocial loss increased by one standard deviation (5.477 points on scale), WHOQOL-BREF Environment domain score increased by 0.381 standard deviations (5.539 points on the scale). The predictor with the next largest standardised beta coefficient was number of life events, $\beta = -.242$, $t = 4.115$, $p < .001$. This means that an increase of one standard deviation in number of life events (2.527 life events) predicted a decrease in WHOQOL-BREF Environment domain score of 0.242 standard deviations (3.518 points on scale). Self-rated health also contributed significantly to the regression model, $\beta = .187$, $t = 2.650$, $p < .01$. The unstandardised beta coefficient for this variable, $b = 7.771$, means that individuals who considered themselves to have good health scored 7.771 points higher on WHOQOL-BREF Environment domain, suggesting better quality of life.

Marital status was the last independent variable to contribute significantly to the model, $\beta = -.120$, $t = 2.032$, $p < .05$. As this is another dichotomous categorical

variable, the unstandardised beta coefficient is more conducive to interpretation than the standardised beta coefficient, $b = -3.763$. This indicates that for individuals who are widowed, single, separated or divorced, WHOQOL-BREF Environment score decreases by 3.763 points compared to those who are married or living as married.

The remaining independent variables were not found to contribute significantly to the regression model. The standardised beta coefficients of these variables were: psychological growth, $\beta = .123$, $t = 1.854$, $p > .05$; number of current medications, $\beta = -.122$, $t = 1.810$, $p > .05$; number of conditions consulting a doctor for, $\beta = .013$, $t = 0.205$, $p > .05$; physical change, $\beta = -.001$, $t = -0.010$, $p > .05$. If a Bonferroni correction was applied to the partial correlations, reducing the alpha level to .006 (.05/8), psychosocial loss and number of life events are the only significant predictors of WHOQOL-BREF Environment domain score.

As stated above, the rejection of the null hypothesis is not straightforward. However, it can be concluded that there is partial evidence in support of hypothesis three with regards to the environmental domain of the WHOQOL-BREF. Specifically, psychosocial loss, number of life events, self-rated health and marital status each significantly accounted for and contributed to the variance in scores on the environment domain of the WHOQOL-BREF. The remaining factors do not significantly account for or contribute to the variance.

7.6.7 CORE-OM Total

When CORE-OM Total was entered into the regression model, with marital status, self-rated health, the three subscales of the MSPSS (significant other, family, and friends), spousal relationship quality, the three subscales of the AAQ (psychosocial loss, physical change, and psychological growth) and number of life events as the independent variables, this model accounted for 30.4 per cent of the variance in CORE-OM Total score ($R^2 = .304$, $F(10, 112) = 4.896$, $p < .001$).

The psychosocial loss domain of the AAQ and number of life events were the only independent variables that significantly contributed to the regression model. The psychosocial loss domain of the AAQ had the larger standardised beta coefficient, $\beta = -.244$, $t = 2.856$, $p < .01$, indicating that as psychosocial loss score increased by one standard deviation (4.504), CORE-OM Total score decreased by 0.244 standard deviations (0.087). Number of life events had the smaller standardised beta coefficient, $\beta = .192$, $t = 2.174$, $p < .05$. This indicates that for each increase of one standard deviation of life events (1.977 life events), the model predicts an increase of 0.192 standard deviations in CORE-OM Total (0.068 points on scale).

The other independent variables were not found to make significant contributions to the regression model: the psychological growth domain of the AAQ, $\beta = -.188$, $t = -1.767$, $p > .05$; spousal relationship quality, $\beta = .146$, $t = 1.641$, $p > .05$; marital status, $\beta = .127$, $t = 1.461$, $p > .05$; significant other (MSPSS), $\beta = -.064$, $t = 0.614$, $p > .05$; self-rated health, $\beta = .061$, $t = 0.686$, $p > .05$; friends subscale, $\beta = -.044$, $t = 0.412$, $p > .05$; the physical change domain of the AAQ, $\beta = .012$, $t = 0.112$, $p > .05$; the family subscale of the MSPSS, $\beta = -.006$, $t = 0.058$, $p > .05$. If a Bonferroni

correction was applied to the partial correlations, reducing the alpha level to .005 (.05/10), there are no longer any significant predictors of CORE-OM Total score.

As above, the rejection of the null hypothesis is not straightforward. However, it can be concluded that there is partial evidence in support of hypothesis three with regards to the CORE-OM-Total score. Specifically, psychosocial loss and number of life events both significantly accounted for and contributed to the variance in scores on the environment domain of the WHOQOL-BREF. The remaining factors do not significantly account for or contribute to the variance.

7.6.8 Diagnostics

It is vital that regression models are examined to establish whether the model fits the data well or whether it is influenced by a small number of cases (Field, 2009). Standardised residuals were examined for each regression model and less than 5 per cent of cases had an absolute value greater than 1.96, indicating that the level of error within each regression model was at an acceptable level. Furthermore, Cook's distance, a measure of the overall influence of each case on the regression model, was below the upper limit of 1 (Cook & Weisberg, 1982) for all cases in each of the regression models, indicating that there were no cases exerting undue influence over the parameters of the models.

7.6.9 Generalisation

There are a number of assumptions of multiple regression which must be true in order to draw conclusions about a population from which a sample is drawn.

Research published in the social sciences often fails to report on the testing of these assumptions, leading to questionable generalisability of the results (Osbourne & Waters, 2002). For a regression model to be generalisable there must be no multicollinearity between pairs of independent variables. The variance inflation factor (VIF) is an indicator of the strength of the linear relationship between independent variables and the tolerance statistic is the reciprocal of the VIF. For each of the regression models the values of the VIF and tolerances were all at acceptable levels (Bowerman & O'Connell, 1990; Menard, 1995; Myers, 1990). It was therefore concluded that the assumption of no multicollinearity was upheld.

A further assumption of multiple regression is homoscedasticity. Homoscedasticity refers to a constant level of variance of the residuals at each level of the predictor. Plots of the standardised residuals were evaluated and were considered to meet this assumption (see Appendix 7.1). In addition, the assumption of linearity was also checked in this manner and the graphs suggested that this assumption was upheld. The assumption of independent errors was tested using the Durbin-Watson test and all values were above the level of significance (1.65; based on the largest group size (100) and highest number of predictors (5) provided in the tables at the 0.01 level by Durbin & Watson (1951). Lastly, the assumption of normally distributed errors was evaluated visually using histograms and normal probability plots. This assumption refers to the residuals in the model being normally distributed, with a mean of 0. This assumption was found to be upheld (Appendix 7.2).

8.0 Discussion

8.1 Study aims

The primary aim of this study was to establish identifiable risk factors for poor psychological health in older adults. As such, the current study was conducted in order to test the hypothesis that relocaters and non-relocaters would differ in terms of their psychological health and also to test this assertion based on individuals' own ratings of themselves as "locals" or "incomers." Furthermore, this study tested a third hypothesis that demographic factors, social factors, health factors, attitudes to ageing, number of life events and relocation status would all contribute to the variance in psychological health within the sample as a whole.

8.2 Summary of findings

Hypothesis one stated that relocaters and non-relocaters would differ in terms of their psychological health, as measured by the HADS, WHOQOL-BREF and CORE-OM. There was not found to be a significant difference between the psychological health of relocaters and non-relocaters in this sample and so this hypothesis was not confirmed. This supports previous research that did not find a significant difference between these groups. In a comparison between relocaters and non-relocaters in Florida in the 1980s, Hendrick, Wells & Faletti (1982) reported that these two groups did not differ on life satisfaction following retirement. Similarly, Lutgendork *et al.* (2001) reported on a comparison of thirty older adults moving into a shared living facility with twenty-eight non-moving controls and found no significant difference in negative mood between the two groups, as measured by The Profile of Mood States short form (Curran, Andrykowski, & Studts, 1995). Although the average age of the

relocaters in the study by Lutgendork *et al.* (2001) was higher than the current study (78.8 years compared to 68.1 years), it is likely that individuals in both samples had been retired for a substantial period of time thus allowing them to adjust to a new phase of life prior to relocation. The mean length of retirement for the relocaters in the current study was 8.0 years and their mean length of residency in the region was 3.0 years, suggesting an average of five years of retirement prior to relocating to the area.

In contrast, Davies (2003) reported that scores on the GHQ (General Health Questionnaire, (Goldberg, 1978), were significantly higher in a group of 160 older adults in a “post-relocation” group compared to a group of 347 older adults who had retired but not relocated (post-retirement group). When compared to the participants in the current study, the participants in the study by Davies (2003) were younger (a mean age of 59 years in the post-retirement group and 65 years in the post-relocation group) and had been retired for an average of 10 months, which is considerably less than the average in the current study. It is therefore possible that the difference observed by Davies (2003) between the psychological health of those in the post-relocation group and those in the post-retirement group was in part due to the participants’ ongoing adjustment to retirement, since this was a recent event. Furthermore when this transition was experienced in combination with relocation, it may have caused higher levels of distress and lower levels of well-being amongst this group. The results of a study by Frier *et al.* (2000) suggest that rates of referral to mental health services in a similar rural region of Scotland were disproportionately higher for relocaters compared to long-term residents although this research was

conducted with adults of working age and it is unclear whether the same is true in the older adult population. The current study, however, suggests that the psychological health of relocaters and non-relocaters does not differ significantly.

The second hypothesis was closely linked to the first but instead used participants' own perception of themselves as "locals" or "incomers." As with the first hypothesis, no significant differences were found between these two groups on any of the primary outcome variables (HADS, WHOQOL-BREF, and CORE-OM). This is in line with the findings from a study by Forsman, Nyqvist, & Wahlbeck (2011), who reported that a lack of sense of belonging was not associated with depression, in a sample of 1102 adults over the age of 65 in Finland. However, this contrasts with previous research in this area that has found that a stronger sense of belonging to a neighbourhood is associated with better physical and mental health in older adults. For example, Young *et al.* (2004) conducted a large scale community survey in Australia with 9445 older women. They measured sense of belonging to a neighbourhood using a seven-item scale that included concepts such as trust and dependability of neighbours as well as friendships and respect amongst the people in the community. Sense of belonging was significantly higher for those who had lived in their current house for longer and there was a positive but weak correlation between this scale and physical and mental health (as measured by the Medical Outcomes Study SF-36, Ware & Sherbourne, 1992).

It is possible that the difference between the findings reported by Young *et al.* (2004) and those reported in the current study and by Forsman *et al.* (2011) may be

influenced by the means of assessing sense of belonging. In the current study, a single item was used to determine self-perception as a “local” or an “incomer.” Similarly, Forsman *et al.* (2011) assessed sense of belonging using agreement with the statement, “I feel I belong and am part of my neighbourhood.” Whilst in the study by Young *et al.* (2004) the concept of sense of belonging was measured using a number of related domains, as outlined above. It may be that this broader concept is more closely related to social integration or social networks rather than purely assessing “belonging.” In addition, the weak correlation found in the large sample in the study by Young *et al.* (2004) suggests that this is not a strong relationship and may be mediated by a third variable.

The final hypothesis of this study was concerned with accounting for the variance in psychological health within the current sample of older adults. It was hypothesised that a range of demographic, health and social factors, as well as attitudes to ageing, number of life events and relocation status would all impact upon the level of psychological health in the current sample. The predictors making a significant contribution to the regression model for HADS-Anxiety, predicting lower levels of anxiety were lower levels of psychosocial loss (AAQ), higher levels of psychological growth (or wisdom; AAQ) and fewer life events in the preceding twelve months (see section 7.6.1). The significant predictors of a lower HADS-Depression score were lower levels of psychosocial loss (AAQ), higher levels of psychological growth (or wisdom; AAQ) and better self-rated health (see section 7.6.2). The results of the regression equations for the quality of life domains will be considered collectively as there is limited research reporting the breakdown of these separate domains within

the older adult literature. Instead, it has been more common for researchers to consider quality of life as a single component (e.g. Low & Molzahn, 2007). The factors found to be significant predictors of better quality of life (as measured by the WHOQOL-BREF domains) in the current study were better self-rated health, lower levels of psychosocial loss (AAQ), positive perceptions of the physical changes in old age (AAQ), higher levels of psychological growth (or wisdom; AAQ), higher levels of social support from friends (MSPSS), fewer life events and being married or living as married (see sections 7.6.3 – 7.6.6). Lastly, the predictors contributing to the variance in CORE-OM-Total score were psychosocial loss (AAQ) and number of life events (see section 7.6.7). These predictors will be considered in turn.

Overwhelmingly, the predictors identified most frequently as contributing to the variance in the measures of psychological health were individuals' attitudes to ageing and those relating to psychosocial loss in particular. It has been proposed by Levy (2003) that a negative perception of older age is developed early in childhood, and confirmed through the experience and selective cognitive processing of decades of life. However, unlike all other forms of stereotypes in society (e.g. sexism or racism), ageism can be experienced both as a perception of others and, if one lives long enough, a perception of self (Snyder & Miene, 1994). Levy (2003) explains that this process of internalisation of age stereotype occurs when an individual reaches old age, whereupon these stereotypes become negative self-stereotypes. Developing this work further, Laidlaw (2010) has suggested that certain events in later life may trigger these self-stereotypes of ageing in a similar manner to the stress-diathesis model. Laidlaw (2010) purports that the perception of negative

experiences associated with ageing, such as physical changes, can act as a stressor which prompts the diathesis, or latent vulnerability, to view oneself according to internalised negative self-stereotype of ageing. Evidence suggests that this phenomenon is not limited to those in western cultures but is also found amongst eastern cultures, where filial piety demands a respect and deference towards one's elders. For example, a recent study found Chinese older adults to hold attitudes to ageing that are comparable with, or more negative than their British counterparts (Laidlaw *et al.*, 2010).

The recurrence of psychosocial loss as a predictor of psychological health suggests that this is an important and particularly mood-congruent concept. The psychosocial loss domain of the AAQ is concerned with the perception that later life is marked by loneliness, depression, loss, worsening health and exclusion from society. It is therefore unsurprising, that the internalisation of these sorts of negative perceptions would be closely tied to psychological distress. If one has spent a lifetime believing old age to be a time of loss and decline, the occurrence of incidents perceived as being related to ageing will trigger negative self-stereotypes and a consequent reduction in well-being, as one increasingly relates to a group in society previously viewed as undesirable.

As the development of a specific measure of personal experience of ageing and perceptions of societal attitudes to ageing (the AAQ) is a recent addition to the research field, the literature in this area is limited (Laidlaw *et al.*, 2007). However, recent research provides additional support for a link between attitudes to ageing and

anxiety. Bryant *et al.* (2012) conducted a study with 421 older adults in Australia and reported an association between more positive attitudes to ageing and lower levels of anxiety as measured by the Geriatric Anxiety Inventory (GAI; Pachana *et al.*, 2007). The current study replicated these findings, and in particular showed a relationship between anxiety and two domains of the AAQ, psychosocial loss and psychological growth. Higher levels of psychological growth were associated with lower anxiety, suggesting that those who feel they have an increasing ability to effectively cope with life, are less likely to be troubled by anxiety and worry. This relationship bears out in clinical practice, where clinicians observe that individuals who feel they lack the capabilities to navigate novel circumstances are those troubled by anxiety disorders. Furthermore, the concept of psychosocial loss relates to the decline of physical, social and psychological functions, thereby bringing an element of uncertainty and threat which is a crucial element in the cognitive theory of anxiety (Borkovec, 1994).

In addition, the small number of studies that have investigated the association between attitudes to ageing and depression have found that older adults with major depression or subsyndromal depressive symptoms report more negative attitudes to ageing (Chachamovich *et al.*, 2008). Similarly, more positive attitudes to ageing are associated with lower levels of depressive symptoms (Bryant *et al.*, 2012). These results are in line with those reported in the current study, which found psychosocial loss and psychological growth to be related to depressive symptoms. These two domains combine to present a picture of increasing loss and decreasing ability to cope with life, self-attributes frequently reported in clinic by those with depression.

When the results from Chachamovich *et al.* (2008) and Bryant *et al.* (2012) are combined with those reported in the current study, a clear picture develops that the more depressed an individual is, the more negative they are about their experience of ageing.

It would appear that the current study is the first to assess the predictive power of attitudes to ageing in relation to quality of life directly. However Bryant *et al.* (2012) reported an association between attitudes to ageing and satisfaction with life, a concept closely tied to quality of life (Shin & Johnson, 1978). As in the present study, lower levels of psychosocial loss were associated with better outcomes on the quality of life measure in this Australian sample. However, Bryant *et al.* (2012) reported that lower scores on psychological growth were associated with better quality of life which is in contrast to the relationship observed in this study. The authors hypothesised that this finding may be an artefact of those with poorer health having developed effective coping strategies to cope with their difficulties, however, the reason for this unexpected finding is unclear. Based on the current study, it would appear that individuals with more positive attitudes to ageing in relation to psychosocial loss in particular experience better quality of life. It is possible that, as an affectively linked domain, attitudes to ageing and more specifically, attitudes to psychosocial loss are more positive in individuals who are enjoying a better quality of life. Moreover, those individuals with a higher quality of life, may have experienced fewer negative incidents that could be attributed to old age, thereby protecting them from internalising negative self-stereotypes of ageing.

The relationship between attitudes to ageing and scores on the CORE-OM has not been directly examined in the past, however Quinn, Laidlaw & Murray (2009) found that, in a sample of 74 older adults in Scotland, individuals endorsing more negative attitudes to ageing reported lower subjective well-being, which is a component domain of the CORE-OM. Furthermore, in the current study higher scores on the psychosocial loss domain were again predictive of poorer scores on the CORE-OM. As the CORE-OM is a measure of social functioning, well-being, problem severity and risk, the association between psychosocial loss and CORE-OM Total score suggests that poorer attitudes to psychosocial loss are associated with poorer psychological functioning in general.

Overall, it would appear that the subscale most predictive of psychological health in this sample of older adults is psychosocial loss. This domain relates to loss of social contacts and supports, reduced involvement in the community and loss of enjoyment in life. The fact that this domain relates so clearly and repeatedly to the different elements of psychological health measured here suggests that feeling disengaged in this manner is detrimental to the well-being of older adults and improving this sense of connectedness and inclusion should be a priority for government and policy makers. Furthermore, this evidence provides clinicians and therapists with a clear basis for targeting attitudes to ageing in therapy as a means for improving psychological health. Indeed, Laidlaw (2010) proposes that attitudes to ageing have many of the characteristics of negative automatic cognitions, such as being believable, distorted and dysfunctional. As such, they could realistically be addressed

using widely used cognitive restructuring techniques. The clinical implications of these findings will be discussed more fully below.

Another variable found to predict psychological health in this sample was the number of life events experienced in the last twelve months. The observed association between life events and anxiety is supported by previous research. For example, it was found that the number of life events experienced in the previous three years was a significant predictor of anxiety symptomatology in a community sample of 70 older adults in the USA (Deer & Calamari, 1998). Furthermore, it has been suggested that certain stressful life events, specifically those involving threat, will lead to anxiety symptoms (Finlay-Jones & Brown, 1981). De Beurs *et al.* (2001) reported evidence to support this hypothesis in a sample of older adults for whom anxiety was significantly associated with having had a major conflict or one's partner or other family member having had an illness. These could all be considered to be circumstances in which there is a threat to self or others. The relationship observed in the current study, between life events and anxiety, is possibly due to the perception of individuals that they are ill-equipped to cope with the challenges brought on by these events. In addition, it is possible that the uncertainty associated with many of the life events measured on the GALES, such as financial concerns, new physical illnesses and marital disputes, could contribute to a sense of apprehension or anxiety in individuals.

There is widespread agreement that adverse life events impact upon well-being, as found in the current study (e.g. Luo & Waite, 2011). However, there is limited

empirical evidence to support this notion and there is even evidence to suggest that daily hassles, rather than discrete adverse events predict well-being (Landreville & Vezina, 1992). The other aspects of the CORE-OM measure (functioning, problems/symptoms and risk) have not been studied in relation to life events in previous research, making this the first study to establish a link between CORE-OM score and adverse life events. This link suggests that increasing numbers of life events may impact upon the overall psychological and social functioning of individuals.

The present study identified a relationship between the number of life events experienced in the last year and an individual's quality of life. It is possible that this link can be understood in the context of sense of control. As previously mentioned, it has been proposed that life events may trigger a sense of uncertainty in some individuals that relates to the development of anxiety (Finlay-Jones & Brown, 1981). For others, life events may represent a loss of control, a concept that has been identified as a fundamental element of quality of life in community dwelling older adults (King *et al.*, 2012).

The current findings provide support for previous research that found a similar association between life events and quality of life. Sherbourne *et al.* (1992) reported that bereavement at baseline was significantly associated with a decline in emotional well-being, a proxy for quality of life, at two-year follow-up, in a sample of 584 individuals aged over 65, despite no significant differences being present at baseline. Furthermore, Hildon *et al.* (2010) found that older adults exposed to adversity (worse

health, more stress, worse life circumstances, a limiting illness or a “negative life event”) had significantly poorer quality of life on the CASP-19, an older adult-specific measure of quality of life. Hildon *et al.* (2010) went on to investigate the factors predicting resilience in the face of such adversity and concluded that social support, more adaptive and accepting coping styles and integration in the community were the characteristics that distinguished resilient individuals from vulnerable ones.

Whilst a sense of integration and belonging in local community was not significantly associated with better psychological health in the current study, social support was, as evidenced by the association between the Friends subscale of the MSPSS and the WHOQOL-BREF social domain. This result suggests that support from friends, but not from family or a significant other, may be indicative of better quality of life. However, it is possible that the relationship between these factors is related to the degree of overlap in the measurement of these domains. Indeed one of the three questions on the WHOQOL-BREF social domain asks about level of satisfaction with support from friends. Consequently, caution should be extended in generalising this association to global quality of life, rather than exclusively social quality of life.

Despite the caution required in interpreting the current results regarding social support from friends and quality of life, there is a significant research base supporting the link between these two concepts in older adults. Paskulin & Malzahn (2007) reported that there were significant moderate correlations between satisfaction with personal relationships and quality of life in a sample of Brazilian ($r = .32$) and Canadian older adults ($r = .41$), using individual items on the WHOQOL-BREF to

assess these concepts. However, when these variables were entered into a regression model they were not found to be significant predictors of quality of life when other variables, such as health satisfaction, meaning in life, adequate finances and satisfaction with leisure were controlled for. Newsom & Schulz (1996) found various measures of social support to be correlated with quality of life in a large sample of 4534 older adults in the USA. They determined social network by the number of close relatives and friends, and frequency of contact with these individuals, as well as the frequency of providing support to others. To assess perceived social support they administered a brief inventory that measured practical and emotional support, along with identification with one's social network. In line with the findings of the current study and those of Paskulin & Malzahn (2007), Newsom & Schulz (1996) reported significant, although weak correlations between both the quantitative and the qualitative measures of social support, and life satisfaction, a similar concept to quality of life. Although, Newsom & Schulz (1996) also found perceived social support to be a strong predictor of life satisfaction when entered into a regression equation, other potential variables were not entered into this model, meaning one cannot be confident in that the findings are comprehensive.

In contrast to the findings reported by Newsom & Schulz (1996) and Paskulin & Malzahn (2007), the current study found perceived social support from friends, but not from family or a significant other, to be associated with better quality of life. This finding supports previous research that found health related quality of life to be significantly lower in those who saw their friends "seldom or never" rather than weekly or monthly (García *et al.*, 2005). Furthermore, in a comprehensive meta-

analysis, Pinquart & Sörensen (2000) report that contact with friends is more strongly associated with subjective well-being, than contact with adult children. However, this finding must be considered in light of the other results from this meta-analysis, which suggested that quality and not quantity of social contacts is more strongly related to subjective well-being in older adults. This finding is supported by the current study as size of social network did not contribute to the variance in psychological health but perceived social support did. Based on the literature it is unclear of the exact contribution made by social support to the quality of life of older adults. Furthermore, the current study does not provide convincing evidence that social network size nor perceived social support are predictive of psychological health in general, but rather suggests there may be an association between quality of life and social support from friends.

Self-rated health was found to predict psychological health in the present study and this link is well established in the literature. In particular, the current study provides further support for the link between poor self-rated health and depression (Harlow, Goldberg, & Comstock, 1991; Kennedy *et al.*, 1990; Kivelä *et al.*, 1996). It is worth noting, however, that none of the other, more objective measures of health in the current study (number of current medications, number of conditions consulting a doctor for and use of medication for long-term health conditions) were predictive of psychological health on any of the primary outcome measures. It is possible that self-rated health, a more subjective question than the other health items, was influenced by the tendency of those with depression or higher levels of depressive symptoms, to view the world, including their own health, more negatively. Evidence

to support this notion is found from studies investigating the link between self-rated health and depression whilst controlling for objective health concerns (Han, 2002).

With regards to the relationship between self-rated health and quality of life, the current study provides support for previous research that has found satisfaction with health to be an important predictor of quality of life. For example, Low and Molzahn (2007) found self-perceived health to be strongly correlated with quality of life in a convenience sample of 432 older adults in Canada. Furthermore, health satisfaction was the strongest contributor to quality of life in a sample of 202 older adults from Canada and 288 from Brazil when compared to meaning in life, satisfaction with relationships, satisfaction with ability to perform activities of daily living and having adequate financial resources (Paskulin & Molzahn, 2007). Within the current study, self-rated health was predictive of the level of quality of life on the physical health and environment domains of the WHOQOL-BREF. This finding is possibly due to an overlap in the measurement of self-rated health and the physical health domain and also due to a tendency for those living in poorer physical and environmental circumstances, to experience poorer health.

The final predictor making a significant contribution to the variance in psychological health in the current study was marital status. The results of the current study provide support for previous research reporting an association between lower quality of life and being unmarried (García *et al.*, 2005) or being a widow or widower (Borglin *et al.*, 2005). In the present study, being married or living as married was found to predict better quality of life on the WHOQOL-BREF Environment domain.

Those who were married or living as married had significantly higher quality of life on this subscale, which covers aspects such as access to health and social care, financial resources and physical safety and security. One possible reason for this specific association may be that couples who are married or living as married are more likely to be living on a shared income, which may provide more resources to sustain a higher standard of living than those who are living on a single income (Gierveld, de Valk, & Blommesteijn, 2000).

It is somewhat surprising that the current study did not find evidence for the predictive value of factors found to relate to depression in other studies. A recent review of risk factors for depression and anxiety in older adults reported that being unmarried, having a smaller social network and having a lack of social support were all predictive of depressive symptoms and depressive disorders (Vink, Aartsen, & Schoevers, 2008). Still other studies have found associations between major depression or dysthymia and adverse life events (Devanand *et al.*, 2002). Whilst these factors were all assessed in the present study, they were not found to predict depression. However, the mean score on the HADS-Depression subscale, was 3.54 and it is possible that this low level of depression within the current study resulted in associations not being observed that have previously been identified in clinical samples. In addition, it is of note that although the current study assessed gender and age, these were not found to be significant predictors of quality of life. However, this is not altogether unexpected as the evidence base appears to be equivocal in relation to the association between age and quality of life (Borglin *et al.*, 2005; Bryant *et al.*, 2012; Gott *et al.*, 2006; Halvorsrud *et al.*, 2010).

8.3 Strengths and limitations

A major strength of the current study is its large sample size and the relatively equal numbers recruited for the two comparison groups. In addition, any significant differences in the demographics of these groups were accompanied by small to moderate effect sizes, apart from in the distinguishing features (e.g. length of residency). The similarity of the groups on these demographic details ensured that the two groups were suitable for statistical comparison.

An additional strength of this study was the use of contemporary, psychometrically robust measures of attitudes and quality of life that have been validated for use with older people. Whilst there are some acknowledged limitations of the use of self-report measures, the main advantage of this method of investigation is the absence of an experimenter bias (Hogg, 2011). As the researcher had no contact with participants at any stage in the study, the responses of the participants can be assumed to be free of any influence of the researcher's own hypotheses or predictions. In addition, the use of structured questionnaires rather than interviews ensures that responses are gathered in a standardised and objective fashion. This method also allows a large amount of information to be gathered at a relatively low cost compared to that which would be required to conduct interviews with the same number of participants.

However, self-report questionnaires, and particularly postal questionnaires have a number of disadvantages which possibly limit the findings of this study. In particular, the absence of an available researcher at the time of completing the

questionnaire may have lead to participants' misunderstandings being uncorrected and consequently questionnaires may have been incorrectly completed. For example, the instructions for the different outcomes measures use various time reference points, from one week to one year prior to completion. It is possible that, without the extra direction from a researcher, some participants may have overlooked these differences in the instructions.

Furthermore, the current study had a low response rate, of 18.1 per cent. Postal questionnaires are known to have low response rates and similar levels have been reported in comparable samples (Deer & Calamari, 1998; Peck *et al.*, 2002). Certain methods were employed that have been identified as enhancing the response rate in postal questionnaires (Edwards *et al.*, 2002). These include providing stamped return envelopes and identifying the research as being based in a university rather than a commercial organisation. However, a number of the factors identified as further promoting the response rate of postal questionnaires, such as sending questionnaires by recorded delivery and offering a monetary incentive for participation, were not used in the current sample due to financial or ethical constraints. This low response rate may limit the generalisability of the current findings.

Indeed, the proportion of the entire sample categorising themselves as having worked in a "professional" role (33%) is higher than the national average, suggesting the current results may over-represent this group (Hicks & Allen, 1999). It is possible that the self-selected sample may be more confident in engaging with written

material, meaning the sample may be unrepresentative of those with poor literacy. Literature also suggests that volunteers who agree to take part in research are lower in neuroticism and higher in conscientiousness, extraversion and agreeableness (Lönngqvist *et al.*, 2007). If these personality factors have played a role in the willingness of individuals to participate in the current study, this may have resulted in lower levels of depression and anxiety being reported compared to what we might expect in the general population, due to the association between these personality factors and psychological health (Matthews & Deary, 2009). Furthermore, high numbers of older adults are becoming informal carers of spouses or other family members, thus limiting their time and availability to participate in research (Grande *et al.*, 2009), meaning this study may have failed to engage this group of older adults. However, the recruitment method employed within the current study is superior to the opportunistic sampling sometimes employed in research (Low & Molzahn, 2007) and is more likely to result in a sample that more accurately represents the wider population.

An additional limitation of the current study is that some of the data for the primary outcome measures was not completely normally distributed. However, as outlined in previous chapters, measures were taken to address this and appropriate caution was extended in interpreting the results. However, these results are perhaps not altogether surprising when it is considered that other researchers have found scores on the HADS to deviate from the normal distribution, in the general adult population (Crawford *et al.*, 2001) and within the older adult population (Luciano *et al.*, 2010). Furthermore, the authors of the CORE-OM state that, ordinarily, this measure is not

normally distributed in non-clinical samples (Connell *et al.*, 2007). Whilst the WHOQOL-BREF is more often normally distributed, various other papers have also found data to deviate from the normal distribution (Hanestad *et al.*, 2004; Jaracz *et al.*, 2006).

As the participants in the current study were community dwelling older adults, it is perhaps unsurprising that responses on the clinical outcome measures (HADS and CORE-OM) clustered at the non-clinical end of the scales and the scores on the quality of life measures clustered at the upper end of the scales (WHOQOL-BREF domains). The risk that volunteer research participants drawn from the community are physically and psychologically healthier than other older adults has been acknowledged by others (Chan *et al.*, 2012) and may suggest that the results from this and other studies are not widely generalisable to the full population of older adults, some of whom may experience levels of physical and psychological ill health requiring care in hospitals or care homes.

This being said, the current sample would appear to have higher rates of long term health conditions, as indicated by the percentage of individuals taking medication for long term conditions (68.9 per cent), compared to the national rates of long term conditions in Scotland (18.8 per cent of 65-74 year olds and 23.5 per cent of over 75 year olds; Loretto & Taylor, 2007). This suggests that the current sample may not be as physically healthy as the majority of older adults in Scotland, although the means of determining long term conditions in the current study differed from that employed by Loretto *et al.* (2007) and may not be comparable.

8.4 Future research

The cross-sectional nature of this study limits the confidence that can be put in the predictors found to contribute to psychological health. To clarify the impact of these predictors on psychological health, longitudinal research is required and is particularly necessary in relation to the attitudinal aspects that may be amenable to psychological intervention.

This study was developed from a clinical hypothesis that older adults who relocate to a rural area of Scotland may be more likely to present at clinical psychology services, as is the case with adults of working age (Freir *et al.*, 2000). Consequently, this study was developed to investigate whether there is a difference between the psychological health of relocated and non-relocated retirees living in the community. As no such difference was found between these groups, the phenomenon of proportionately more older adult “incomers” than “locals” attending clinical psychology services may be related to a variety of factors. One possible cause is that individuals moving into the area may have more favourable attitudes to mental health services (Quinn *et al.*, 2009) and subsequently be more likely to seek out services or attend appointments following a referral. These hypotheses warrant further research in order to clarify the picture for therapists and policy makers alike, who are expected to provide equitable mental health services for all older adults requiring them.

8.4 Clinical implications

The clinical purpose of this study was two-fold: to determine identifiable risk factors in older adults that would serve as markers to primary health care providers to support the identification and treatment of poor psychological health; and to identify risk factors which may be open to adaptation using a psychological perspective, through evidence based treatments for older adults such as cognitive behaviour therapy (CBT; Laidlaw *et al.*, 2008).

In relation to the first purpose, health and social care providers can be vigilant for the following risk factors for poor psychological health in older adults: higher numbers of adverse life events in the previous year, a lack of perceived social support from friends, poor self-rated health, being unmarried or without a partner and having poorer attitudes to ageing. At the present time, despite the availability of evidenced based treatments for depression in older adults (Wilson *et al.*, 2008), this age group proportionately underutilises mental health services (Crabb & Hunsley, 2006). This underutilisation cannot be attributed to the attitudes of older adults towards seeking support from mental health services, which have been shown in the literature to be favourable (Mackenzie *et al.*, 2008). Furthermore, older adults regard psychotherapy and pharmacological treatments for depression as effective and acceptable but view psychotherapy as having significantly less chance of unwanted side-effects (Kuruvilla *et al.*, 2006). When given a choice of treatment options, older adults with depression have a preference for psychotherapy over pharmacological treatments, yet only a minority receive this (Gum *et al.*, 2006; Unützer *et al.*, 2003). Therefore, professionals working with older adults must be alert to their own beliefs

surrounding the justifiability and understandability of depression (Burroughs *et al.*, 2006; Law *et al.*, 2010) that may hinder appropriate diagnosis and treatment of this condition. In addition, mental health services need to be designed so as to effectively offer evidenced based and acceptable methods of treatment for depression in older adults.

In relation to the second purpose, there are a number of psychological interventions that would address some of these predictors of poorer psychological health. In particular, CBT offers promise in terms of addressing negative attitudes to ageing. Bryant *et al.* (2012) describe attitudes as “beliefs that have an evaluative component,” (pp.1). Unhelpful beliefs, or dysfunctional cognitive distortions, are a key focus in CBT and therapy aims to teach individuals to identify and challenge these negative automatic cognitions (Clark *et al.*, 1999). In addition, there is a body of work that sets out how therapists might effectively address and challenge negative self-stereotypes of ageing in order to improve psychological health. Laidlaw, Thompson & Gallagher-Thompson, (2004) have developed a comprehensive and therapeutically applicable conceptual framework for depression in older adults. Based on the established CBT model of depression (Beck *et al.*, 1979), this framework incorporates additional domains including the socio-cultural context of attitudes to ageing. Within this framework, therapists can address cognitions that are barriers to progress in therapy or are maintaining an individual’s low mood.

Finally, the results of this study highlight the importance of improving the societal stereotypes of ageing that may be influencing the attitudes to ageing of future

generations of older adults. Legislation and policy is required which seeks to draw attention to the contribution of older adults and the positive aspects of ageing. In addition, the recurrent influence of psychosocial loss on psychological health suggests that work should be done to aid older adults in continuing social and interpersonal roles into old age.

8.5 Conclusions

The current study did not find a significant difference between the psychological health of retired relocaters and non-relocaters in rural Scotland. Rather, the factors predicting better psychological health were many and varied, with significant influence exerted by attitudes to ageing. In line with previous research, the current findings suggest that attitudes to ageing play a crucial role in well-being and psychological health in later life. It is imperative therefore, that clinicians and policy makers find ways to promote positive attitudes to ageing at an individual and societal level in order to support current and future generations of older adults to age successfully.

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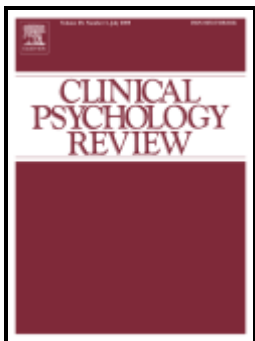
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Appendices

Appendix 1	A1.1 Clinical Psychology Review – Author Information Pack
Appendix 2	A2.1 Quality Assessment rating by second rater (JH) A2.2 Variables found to be non-significant in their associations to incident depression
Appendix 3	A3.1 Participant invitation letter A3.2 Participant Information sheet A3.3 Letter of endorsement from the Cauldicott Guardian for the CHI in NHSDG A3.4 Questionnaire booklet
Appendix 4	A4.1 REC approval A4.2 R&D approval
Appendix 5	A5.1 International Psychogeriatrics – Instructions for Contributors
Appendix 6	A6.1 Assessing normality - Skewness and Kurtosis z scores A6.2 Assessing normality and homogeneity – Histograms and normal P-P plots of frequency distributions for primary outcome variables A6.3 Assessing homogeneity of variance – Results of Levene’s Test on outcome variables pre-transformations
Appendix 7	A7.1 Assessing homoscedasticity and linearity A7.2 Assessing the assumption of normally distributed errors
Appendix 8	A8.1 Correlations between outcome measures

Appendix 1

A1.1 Clinical Psychology Review – Author Information Pack



Article structure

Manuscripts should be prepared according to the guidelines set forth in the Publication Manual of the American Psychological Association (6th ed., 2009).

Manuscripts should ordinarily not exceed 50 pages. Exceptions may be made with prior approval of the Editor in Chief for manuscripts including extensive tabular or graphic material, or appendices.

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Appendix 2: Systematic Review

A2.1 Quality Assessment rating by second rater (JH)

Study	Clearly focussed question	Similar comparison groups	Recruitment rate reported	Acceptable drop-out rate ($\leq 20\%$)	Participants lost to follow-up not significantly different	Clearly defined outcome measure	Valid and reliable outcome measure	Same outcome measure used throughout	Main potential confounding variables taken into account	Sufficient length of follow-up (≥ 12 months)	Confidence intervals provided	Total
Chan et al. (2012)	3	3	0	2	2	3	3	3	3	3	3	28
Jaussent et al. (2011)	3	3	0	0	3	3	3	3	3	3	3	27
García-Fabela et al. (2009)	2	3	0	2	2	3	3	3	3	3	3	27
Cho et al. (2008)	3	1	0	3	0	3	3	3	1	3	3	23
Kim et al. (2006)	2	3	0	2	3	3	3	3	1	3	3	26
de Jonge et al. (2006)	3	3	3	1	0	3	3	3	3	3	3	28
Perlis et al. (2006)	3	3	0	1	0	3	3	3	1	3	3	23

A2.2 Variables found to be non-significant in their associations to incident depression

Study	Variables found to be non-significant in their associations to incident depression
Chan et al. (2012)	Age, education, marital status, alcohol consumption, multimorbidity, antidepressant medication
Jaussent et al. (2011)	Sleep quality, early morning awakening, homeopathic and non-prescription sleep medications
García-Fabela et al. (2009)	-
Cho et al. (2008)	Medical disease, age, gender, marital status, education. In those with prior depression: medical disease, age, gender, marital status, duration of last depressive episode, number of prior major depressive episodes
Kim et al. (2006)	Pre-existing stroke, pre-existing hypertension, pre-existing diabetes, incident stroke, incident heart disease, incident hypertension, incident diabetes, baseline blood pressure, baseline blood glucose
de Jonge et al. (2006)	an interaction between diabetes and co-morbidity, an interaction between diabetes and instrumental disability, an interaction between diabetes and basic disability
Perlis et al. (2006)	-

Appendix 3

A3.1 Participant invitation letter



Dear Sir/Madam

Your name was selected at random from the Community Health Index by the Public Health Department of NHS in order that I could invite you take part in my research. Your medical records were not accessed as part of this process and I have no record of your contact details.

As part of my training in Clinical Psychology at the University of Edinburgh, I am carrying out a research project with retired individuals living in . I am interested in the psychological health and well-being of these individuals. I hope to investigate this by asking retired individuals to complete a set of questionnaires which assess different elements of psychological health and well-being.

If you meet the criteria listed below, I would invite you to read the information sheet enclosed and consider whether or not to take part in my study. If you do not meet **all** of these criteria, please return the pack to me in the pre-paid envelope enclosed, without completing it, or throw the pack away.

Are you:

- Retired (at or after the age of 55)?
For the purpose of this study, I consider an individual to be retired if: they consider themselves to be retired, their main income is pension based funds rather than wages or they work significantly reduced hours (less than half their previous hours).
- Not living in residential or nursing care?
- Able to complete the questionnaires unaided?

If you answered yes to all of these questions, please read the enclosed Information Sheet before deciding whether you wish to take part in this research.

Thank you for your time.

Yours sincerely

Anna Graham
Clinical Psychologist in Training

Supervised by Dr Kenneth Laidlaw, Senior Lecturer in Clinical Psychology, University of Edinburgh and Dr John Higgon, Consultant Clinical Psychologist, NHS

A3.2 Participant Information sheet



Information sheet

Study Title: The Psychological Health of Retirees in
Researcher: Anna Graham

I would like to invite you to take part in my research study. Before you decide, I would like you to understand why the research is being done and what it would involve for you.

What is the purpose of this study?

For many people retirement is an enjoyable stage of life, full of new opportunities. For others it is not so easy. I am interested in all experiences of retirement and I would be very grateful to find out how you are finding retirement.

What will I have to do if I take part?

I have enclosed a pack of questionnaires which you would need to complete and return to me in the pre-paid envelope provided. The first questionnaire asks for some details about your age, how long you have been retired, how long you have lived in the area and other information about yourself. There are also some questionnaires that ask about things such as your mood, your satisfaction with life and your social support. In total, participation would involve 45-60 minutes of your time.

If you wish to take part, please complete all the questions on the questionnaires and return them to me in the envelope provided. You do not need to put a stamp on the envelope as postage has already been paid. Choosing not to participate in this research will not affect the health care you receive.

What are the possible benefits of taking part?

When people take part in research, they often want to know who will benefit from their involvement. It is unlikely that taking part in my research will benefit you directly but I hope that it will help local NHS teams and voluntary organisations to provide the right support and advice for retired individuals in the future.

Will my taking part be kept confidential?

Participation in my research is anonymous and all the information you provide is confidential and will be locked in a filing cabinet at [redacted] whilst the project is ongoing. Once the project is finished and the results have been written up, your anonymous questionnaires will be stored for five years according to research guidelines. After this time they will be destroyed confidentially. The information you provide will not be published in a way which makes you identifiable. Instead, everyone's responses will be added together and reported collectively.

Do I have to take part?

You can choose not to take part in this research and your health care will not be affected by this decision. Neither will you receive further contact from the researcher.

What if there is a problem?

Some of the questionnaires ask about thoughts of suicide. If you are experiencing these sorts of thoughts, please contact your GP or call The Samaritans (08457 90 90 90).

Who has reviewed the research?

This research has been approved by the University of Edinburgh and the West of Scotland Research Ethics Committee. Throughout this research project, I will be supervised by Dr Kenneth Laidlaw, Senior Lecturer in Clinical Psychology, University of Edinburgh and Dr John Higgon, Consultant Clinical Psychologist, NHS

What will happen to the results of the research?

The results of the research will be submitted to the University of Edinburgh as part of my doctoral thesis in Clinical Psychology. In addition, they may be submitted to a clinical journal for publication. At no time will identifiable information about participants be included in these documents. If you would like to receive a summary of the results of this project please contact me.

Contact details for further information:

If you have any further questions about this research please contact me:

Anna Graham

anna.graham@nhs.net

If you have any questions about participating in this project and would like to discuss it with someone independent please contact:

A3.3 Letter of endorsement from the Cauldicott Guardian for the CHI in region

Directorate of Public Health



25 November 2011

TO WHOM IT MAY CONCERN

Dear Sir/Madam

I am delighted to be supporting Anna Graham in her research with people living in . NHS is consistently looking to improve the health and well-being of those living within the region and this project will help us to identify the factors which contribute to a positive experience of retirement.

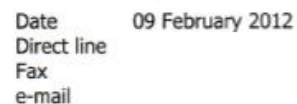
You were selected at random from the Community Health Index, a record of all individuals living in the region and registered with a GP. Your medical records were not accessed at any point. Staff in my department regularly work with this index and they were responsible for sending out all information and questionnaire packs. Confidentiality is fundamental to the work of the NHS and is upheld and maintained by all staff working on this project. I would encourage you to consider taking part in this valuable research.

Yours sincerely

Director of Public Health

A3.4 Questionnaire booklet

Due to copyright legislation, the questionnaires used in the current study cannot be republished.



Study title:	The Psychological Health of Relocated Retirees in Rural Scotland
REC reference:	12/WS/0004

The further information was considered, in correspondence by a sub-committee of the REC. A list of the sub-committee members is attached.

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below.

NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

The favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at <http://www.rdforum.nhs.uk>.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Covering Letter	-	-
REC application	-	13 December 2011
Protocol	1	16 December 2011
Investigator CV	-	14 November 2011
Letter of invitation to participant	2	21 January 2012
Participant Information Sheet	3	21 January 2012
Participant Consent Form	2	16 December 2011
GP/Consultant Information Sheets	1	21 January 2012
Evidence of insurance or indemnity	-	06 July 2011
Other: Letter from supporting the research	-	25 November 2011
Other: Letter from	-	25 November 2011
Questionnaire: Demographic Questionnaire	2	12 December 2011
Questionnaire: HADS Questionnaire	1	17 January 2012
Questionnaire: AAQ-24 Questionnaire	1	17 January 2012
Questionnaire: GALES Questionnaire	1	17 January 2012
Questionnaire: Demographic Questionnaire	1	17 January 2012
Questionnaire: SRQ Questionnaire	1	17 January 2012
Questionnaire: HMT Questionnaire	1	17 January 2012
Questionnaire: MSPSS Questionnaire	1	17 January 2012
Questionnaire: WHOQOL-BREF Questionnaire	1	17 October 2011
Questionnaire: CORE Questionnaire	1	17 January 2012
Response to Request for Further Information	-	24 January 2012

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review

12/WS/0004

Please quote this number on all correspondence

With the Committee's best wishes for the success of this project.

Yours sincerely

Enclosures: List of names and professions of members who were present at the meeting
"After ethical review – guidance for researchers"

Copy to:

A4.2 R&D approval

Research and Development Support Unit



Mrs Anna Graham

Date: 9th February 2012

Our ref: 12/DGY/002.

Study title: The psychological Health of Relocated Retirees in Rural Scotland

Dear Mrs Graham

Thank you for sending me details of your study with a request for management approval. I can confirm that the study review team has reviewed the documentation and on this basis I am pleased to inform you that your study has management approval for commencement within NHS

It is a condition of this approval that everyone involved in this study abides by the guidelines/protocols laid down by this Health Board in respect of confidentiality and Research Governance. It is your responsibility to ensure you are familiar with these; please do not hesitate to seek advice if you are unsure. (Copies of Research Governance Framework document available via the website www.sehd.scot.nhs.uk/cso and then use the publications link).

We also note that it is the sponsor's responsibility to ensure that appropriate training is in place for all local investigators. It is important that all research must be carried out in compliance with the Research Governance Framework for Health and Community Care and the new EU Clinical Trials Directive (for clinical trials involving investigational medicinal products).

As part of the Health Board's responsibilities under Research Governance a sample of studies will be monitored, and it is therefore important that all records in connection with the study are kept up to date and available for review. We are also required to inform you that details of your study will be entered onto our R&D database. As custodian of the information collated during this research project, you are responsible for ensuring the security of all personal information collected, in line with NHS Scotland IT Security Policies, until the destruction of this data.

If your study is adopted by UKCRN into a portfolio then please advise this department of recruitment figures by adding accrual data to that database on a monthly basis.

Research and Development Support Unit



Please notify the R&D office immediately you become aware of any serious adverse events associated with this research.

You must contact the R&D Department if/when the project is subject to any minor or substantial amendments so that these can be appropriately assessed, and approved, where necessary. I understand that performance of this study will not infringe on NHS ability to deliver our usual level of service.

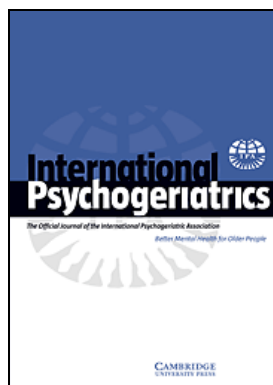
It is a condition of this approval that you ensure your line manager is aware of the activity you propose and gives appropriate approval prior to you undertaking any project related activities.

May I take this opportunity to wish you every success with your project. Please do not hesitate to seek help and advice from the R&D Support Unit if there is anything which you feel you would like assistance with. I look forward to hearing about your work as it progresses and would appreciate a short annual report and a final report when the study is complete.

Yours Sincerely.

Appendix 5

A5.1 International Psychogeriatrics – Instructions for Contributors



Organization and style of research articles

Title page and corresponding author: Each article must have a title page with the title of the article, a list of all authors and their titles, affiliations and addresses. Author qualifications should not be listed as these are not published in the journal. The title page should explicitly identify the author to whom correspondence about the study should be addressed and that author's email address, telephone number, fax number and postal address must be clearly stated.

Abstract: Abstracts should be brief, structured and should incorporate the 4 sub-headings: background, method(s), results and conclusion(s). Abstracts should communicate the primary findings and significance of the research. They should not exceed 250 words in length.

Key words: Under this heading and beneath the abstract, please list up to 8 words for the purpose of indexing.

Running title: This should contain no more than 50 characters including spaces.

Introduction: Briefly state the relevant background to the study to provide the necessary information and context to enable non-specialists to appreciate the objectives and significance of the paper. Most introductions to articles received for review are too long.

Methods: Materials and procedures should be described in sufficient detail to enable replication. Any statistical procedures used should be outlined and their use should be justified here. Results should not be included in the Method(s) section. If statistical procedures are used, they should be described here in adequate detail. Choice of statistical technique should be justified including some indication of the appropriateness of the data for the technique chosen. Adequacy of the sample size for the statistical technique(s) used must be addressed. If appropriate, a description of the statistical power of the study should be provided. If multiple univariate significant tests are used, probability values (p-values) should be adjusted for multiple comparisons, or alternatively a multivariate test should be considered. Further advice about statistics and *International Psychogeriatrics* can be found in the following article: Chibnall, J. (2000) Some basic issues for clinicians concerning things statistical. *International Psychogeriatrics*, 12, 3-7. The following article may also be of assistance to intending contributors: Chibnall J.T. (2004). Statistical audit of original research articles in *International Psychogeriatrics* for the year 2003. *International Psychogeriatrics* 16, 389-396. Both of these are available at the *International Psychogeriatrics* website by following the link to Statistical Advice for intending contributors. This is also located under the related links icon at the journal homepage (<http://journals.cambridge.org/ipg>).

Results: This section may contain subheadings. Authors should avoid mixing discussion with the results. Sample sizes should be delineated clearly for all analyses. Some indicator of variability or

sampling error should be incorporated into the reporting of statistical results (e.g. standard deviation, standard error of the mean). Wherever possible an indicator of effect size (e.g. Cohens d , η^2 , Cramers V , 95% confidence interval) should be reported in addition to p values. If multiple univariate statistical tests are used p values should be adjusted for multiple comparisons or alternatively a multivariate test should be used. Obtained statistical values for tests should be reported with degrees of freedom (e.g. t , F , χ^2).

Discussion: Interpretation of the results with respect to the hypothesis(es) and their significance to the field should be discussed here. Results should be interpreted in the light of the size of the effect found and the power of the study to detect differences. Any methodological weaknesses of the study should be outlined, including limitations imposed by sample size. Careful consideration of the conclusion(s) for accuracy and alternative interpretation, and possible conflicts or resolution of conflicts in the field is encouraged. Limited speculation and directions for future research can be included.

Conflict of interest declaration: **This section must be completed.** This should follow the discussion and precede the references. Where there is no conflict of interest perceived to be present the heading **Conflict of Interest** should be included with the single word “none” underneath it. For full details see below.

Description of authors’ roles: **This section must be completed if the paper has 2 or more authors.** It should contain a very brief description of the contribution of each author to the research. Their roles in formulating the research question(s), designing the study, carrying it out, analysing the data and writing the article should be made plain. For example: H. Crun designed the study, supervised the data collection and wrote the paper. M. Bannister collected the data and assisted with writing the article. N. Seagoon was responsible for the statistical design of the study and for carrying out the statistical analysis.

Acknowledgements: Any acknowledgements other than conflict of interest declarations in regard to sponsorship should be listed briefly here.

References: **No more than 30** articles that have been published or are in press should be cited. If authors believe that more than 30 references are essential this must be justified in the cover letter. Unpublished data, personal communications, and manuscripts submitted for publication should be cited in the text and the supporting material submitted with the manuscript. *International Psychogeriatrics* uses the Harvard referencing system. Within the text of each paper journal articles should be cited in the style (Smith and Jones, 1999). Where an article quoted in the body of the text has more than two authors the term “*et al.*” should be employed, i.e., (Smith *et al.*, 1999). Text citations of multiple articles should be separated by semicolons, i.e., (Smith and Jones, 1999; Smith *et al.*, 1999). At the end of each paper, all cited references should be listed alphabetically in the style indicated below. If the Digital Object Identifier (doi) is known, it should be added to the reference.

For a journal article: **Smith, J., Jones, W. I. and Doe, J. T.** (1996). Psychogeriatrics for pleasure and profit: an expanding field. *International Journal of Unreproducible Results*, 3, 240–242. doi:12.3456/S123456789.

For a book: **Smith, J.A., Brown, P.Q., Jones, H.A. and Robinson, D.V.** (2001). *Acute Confusional States*. New York: Cambridge University Press. For a book chapter. **Park, K., Tiger, B. and Runn, F.** (1999). Psychogeriatrics in context. In G.Verdi and A. Boito, (Eds.) *New Medical Specialties* (pp. 240–260) Cambridge: Cambridge University Press.

Where an article or book chapter has more than six authors only the first author’s name should be given followed by the words “*et al.*”.

For further examples of reference style see papers in recent issues of *International Psychogeriatrics*.

Figures/Tables: The manuscript should contain no more than five figures or tables. The copies submitted with the manuscript must be of sufficient quality to enable reviewers to evaluate the data. The journal has a small budget to permit some colour to be printed in come issues but authors wishing to publish figures requiring colour to communicate the data *may* be required to pay some or all the additional cost.

Figure/Table legends: Each caption should begin with a brief description of the conclusion or observation provided in the figure. These should be submitted as a separate section after the References.

Supplementary material: More detail about the submission of supplementary material is available below – see “Supplementary Material for online only publication” and “Instructions for contributors – Supplementary Material” in subsequent pages of this document.

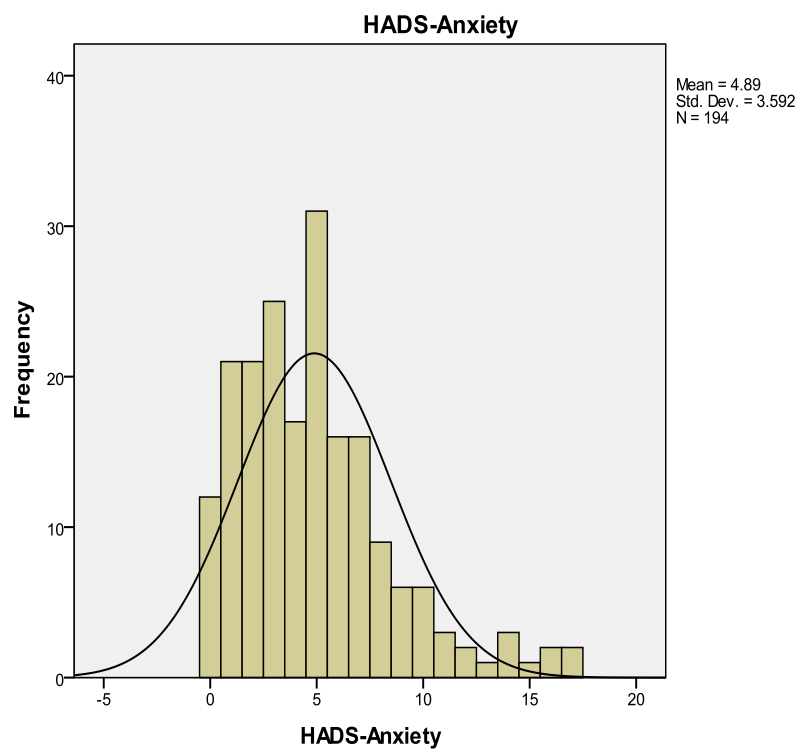
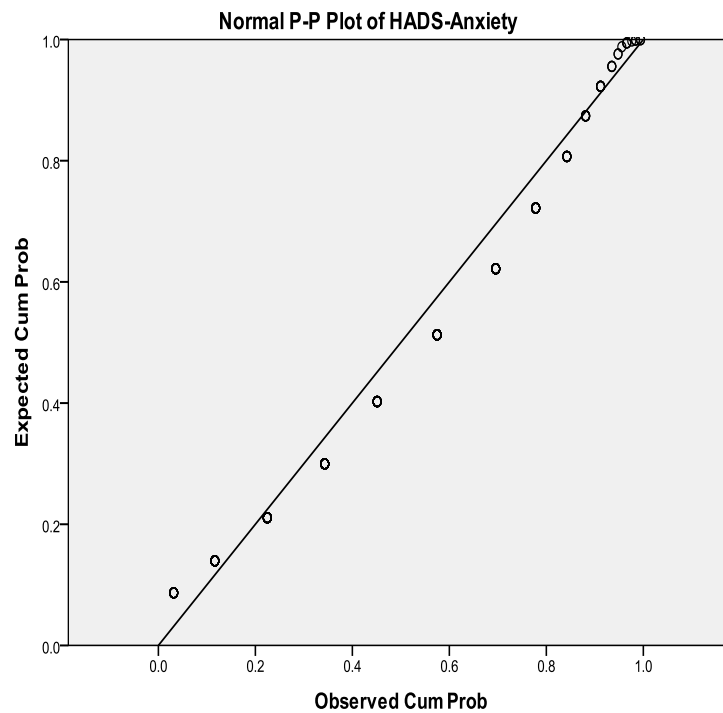
Word limits: At present *International Psychogeriatrics* does not have a fixed word limit for articles, but because of limited space, short articles have a higher chance of acceptance than longer ones of an equivalent standard.

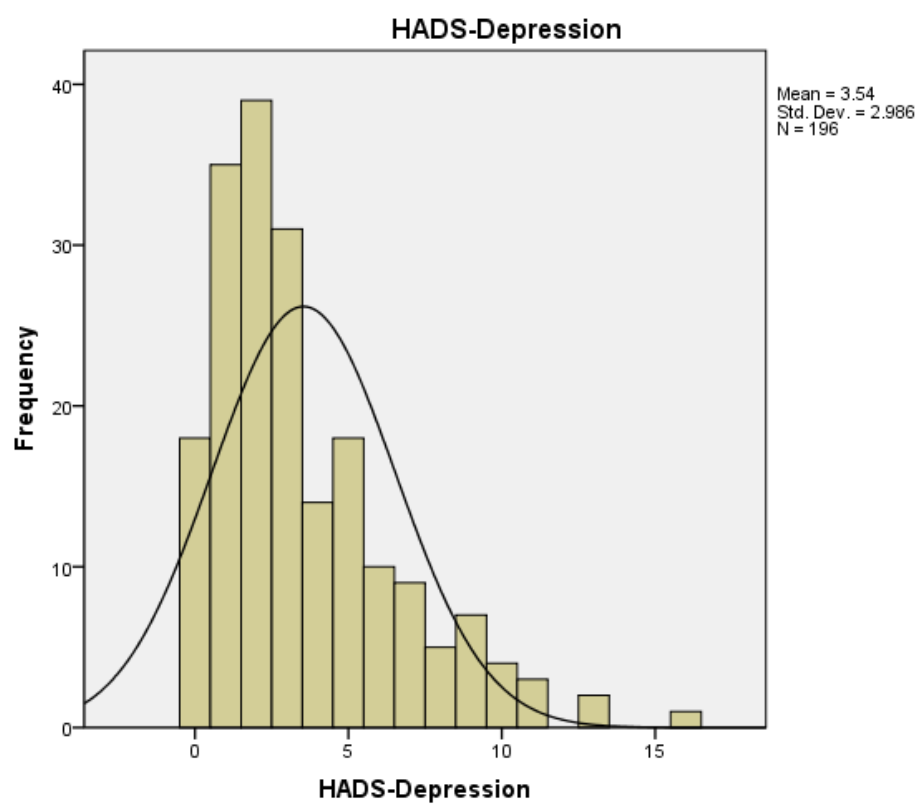
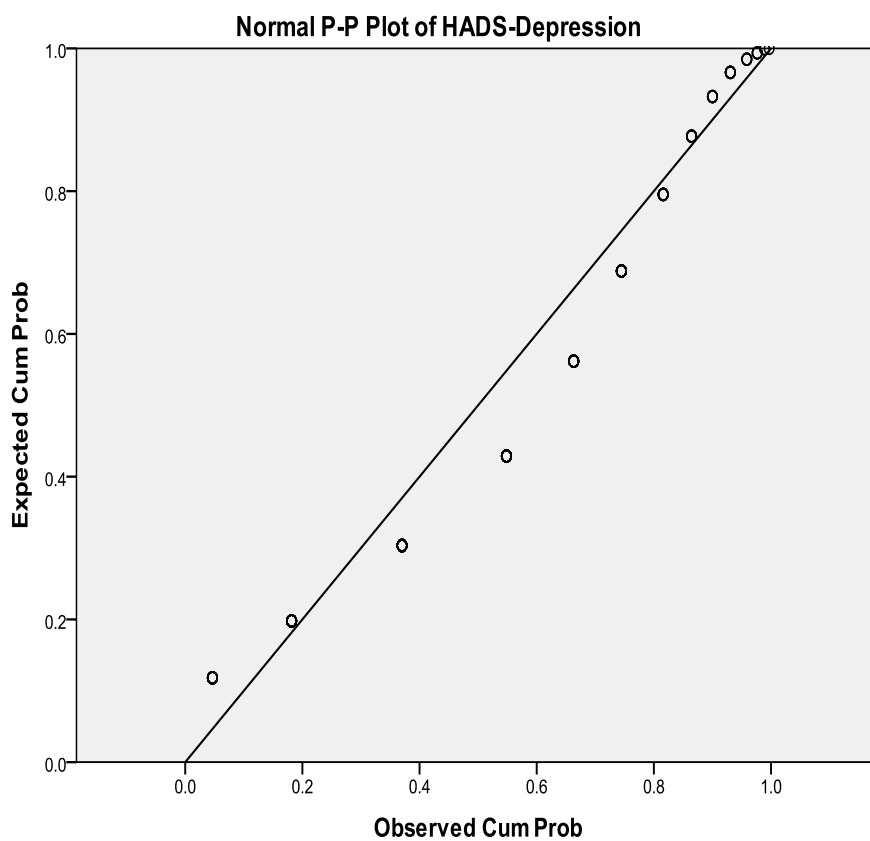
Appendix 6

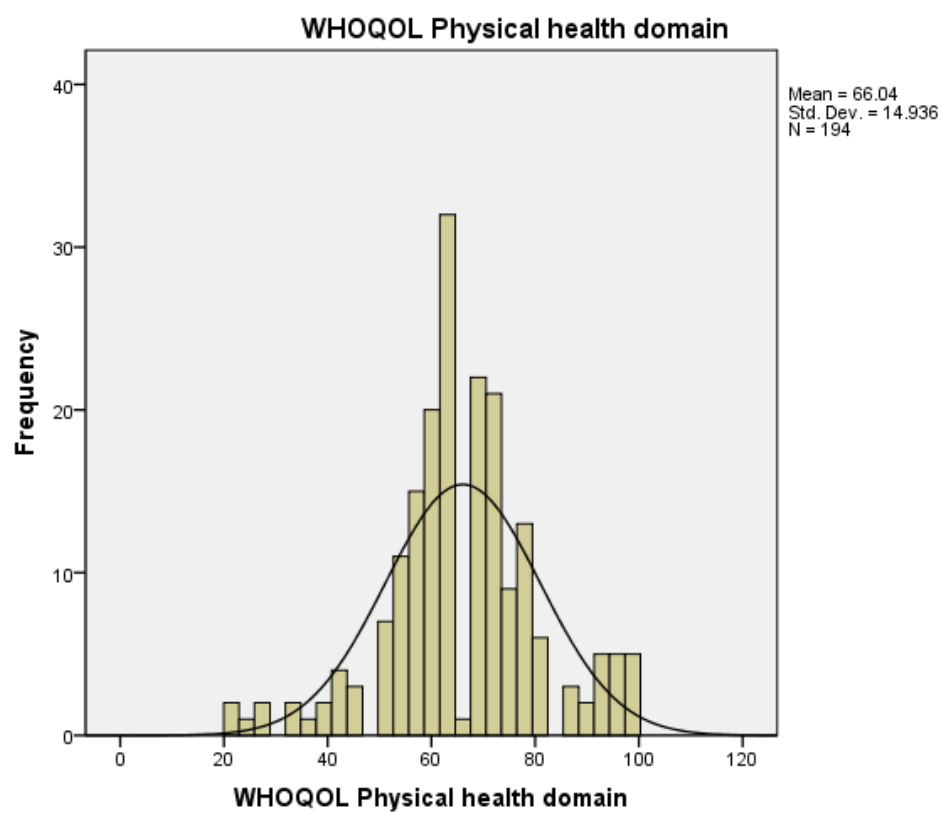
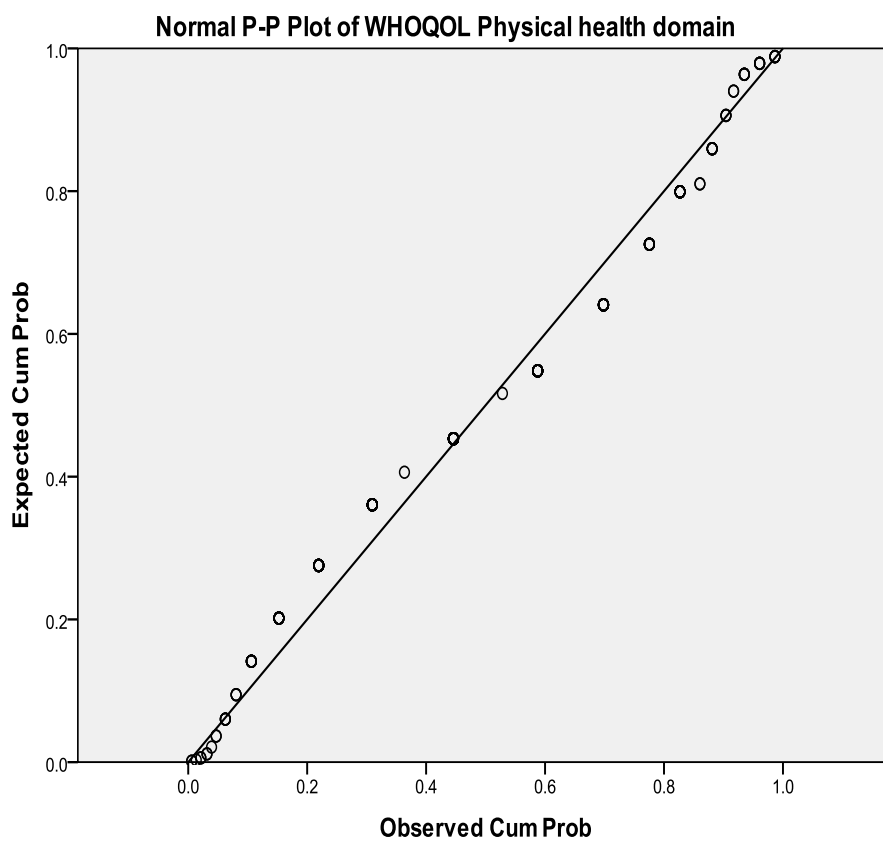
A6.1 Assessing normality – Skewness and Kurtosis z scores

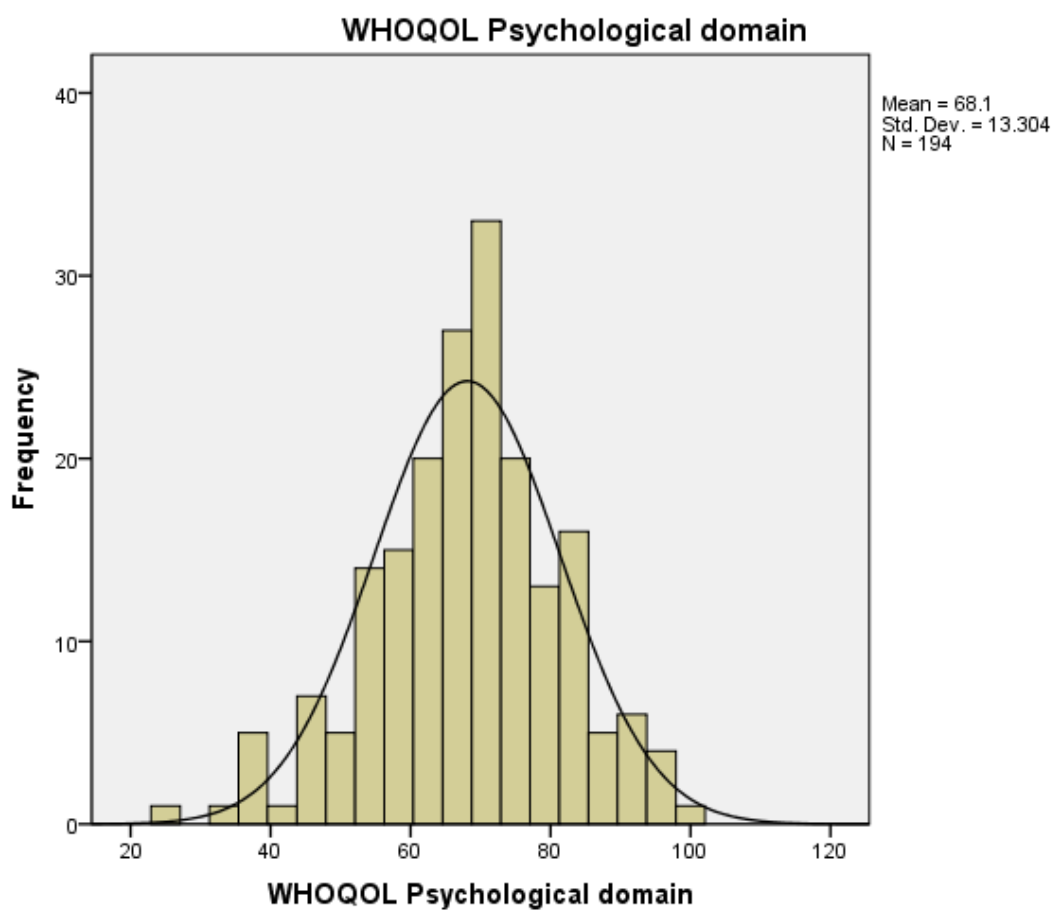
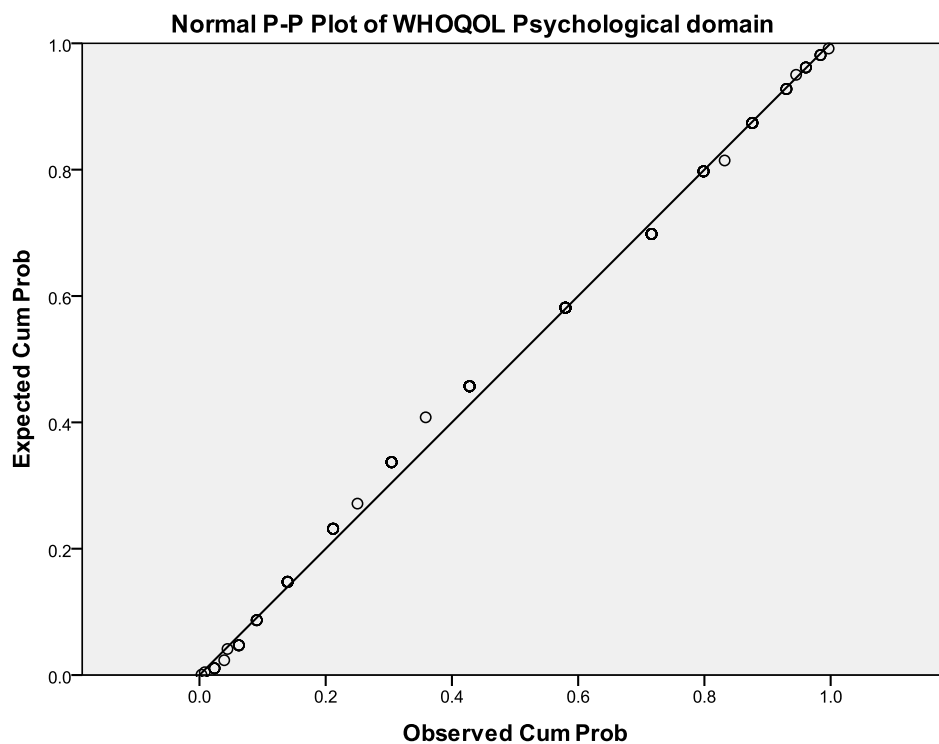
Measure/Sub-scale	Skewness z score	Kurtosis z score
HADS-Anxiety	6.39	4.07
HADS-Depression	7.40	4.83
WHOQOL Physical health domain	-0.82	2.67
WHOQOL Psychological domain	-1.71	0.93
WHOQOL Social relationships domain	-2.66	-0.06
WHOQOL Environmental domain	-8.06	9.03
CORE-Total	9.27	8.79
CORE-Total minus risk	8.87	7.87

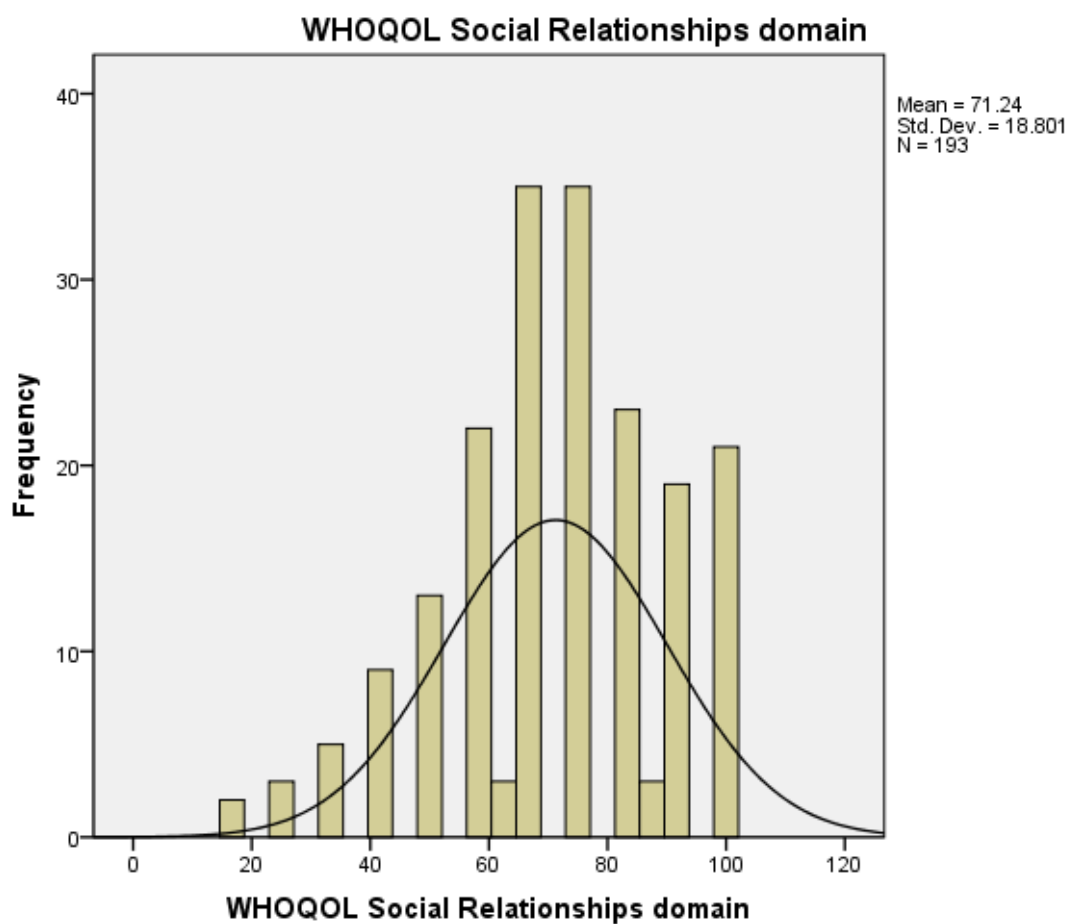
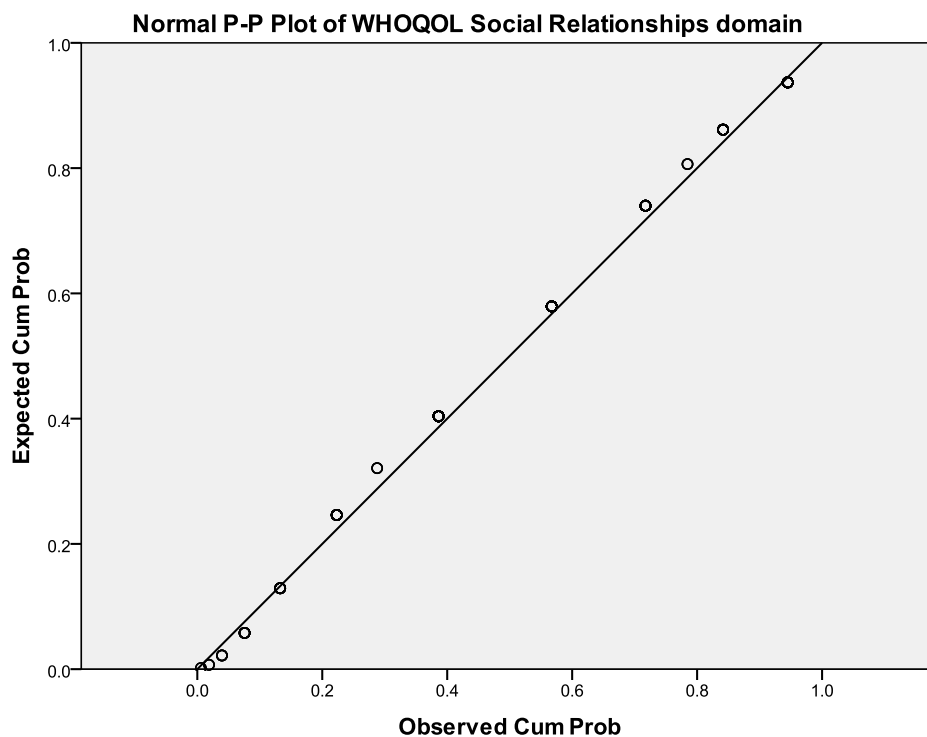
A6.2 Assessing normality and homogeneity – Histograms and normal P-P plots of frequency distributions for primary outcome variables

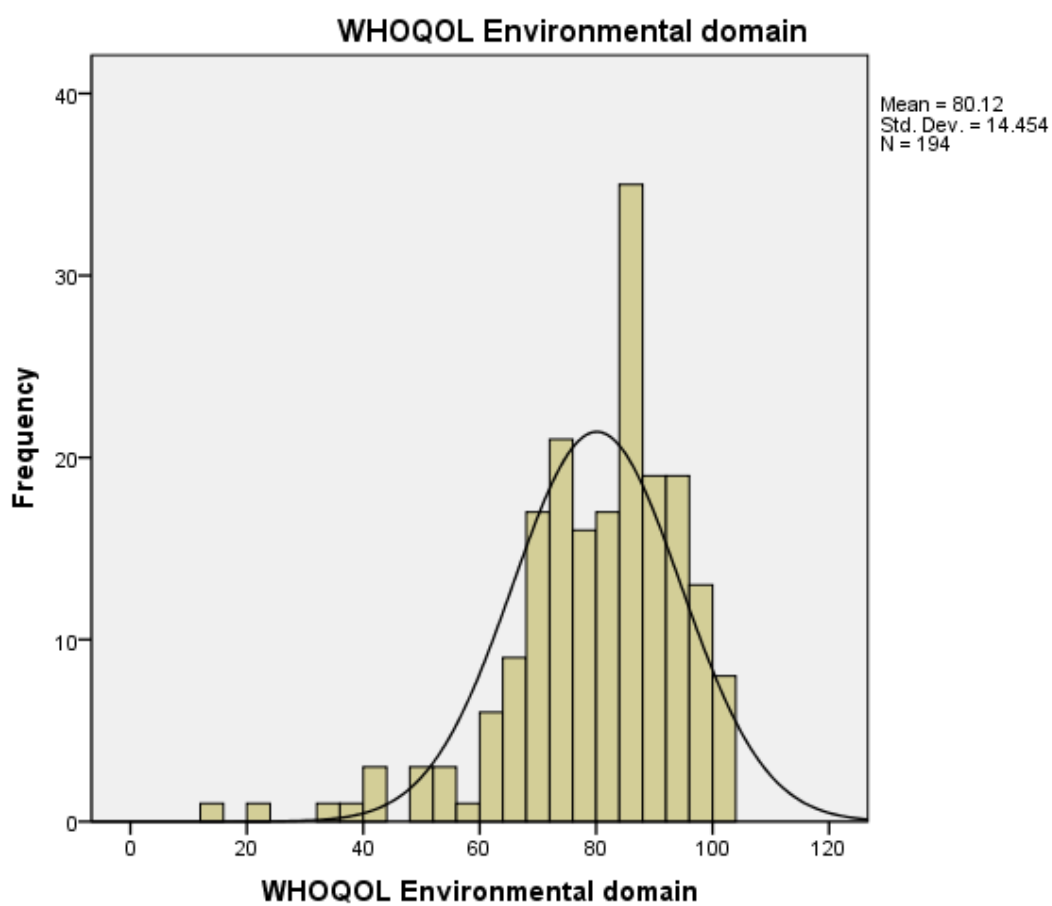
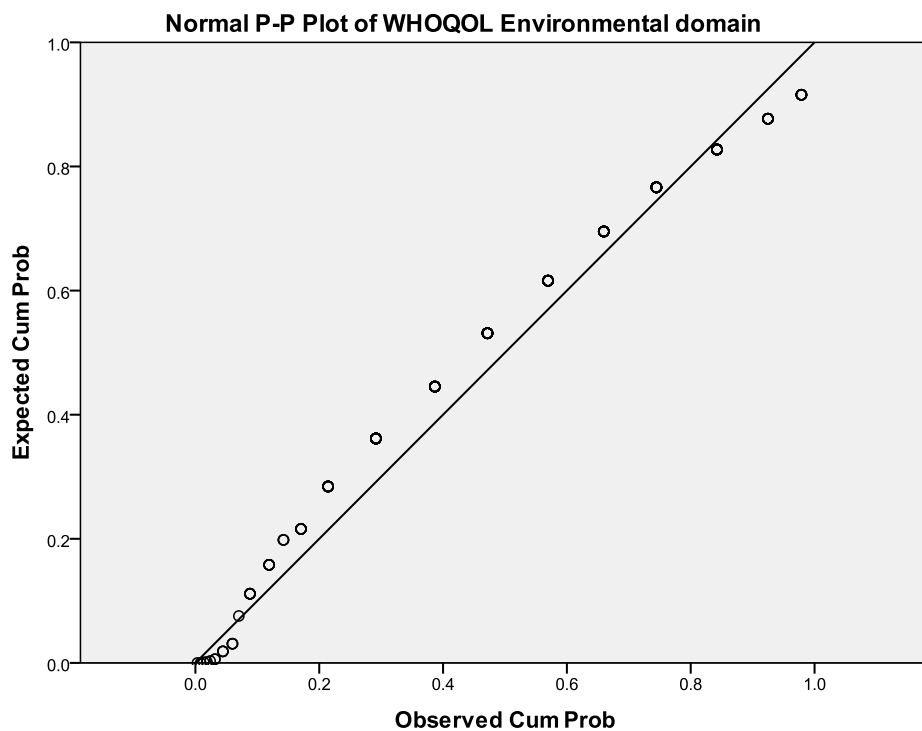


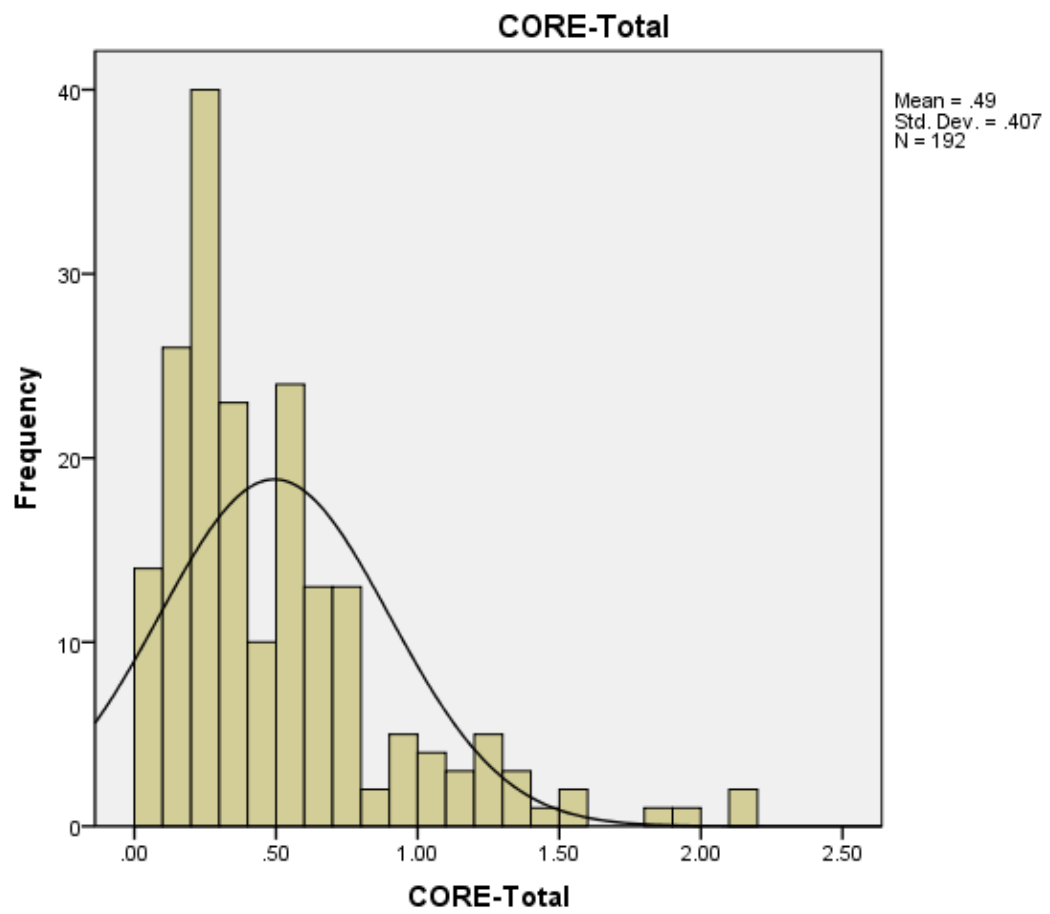
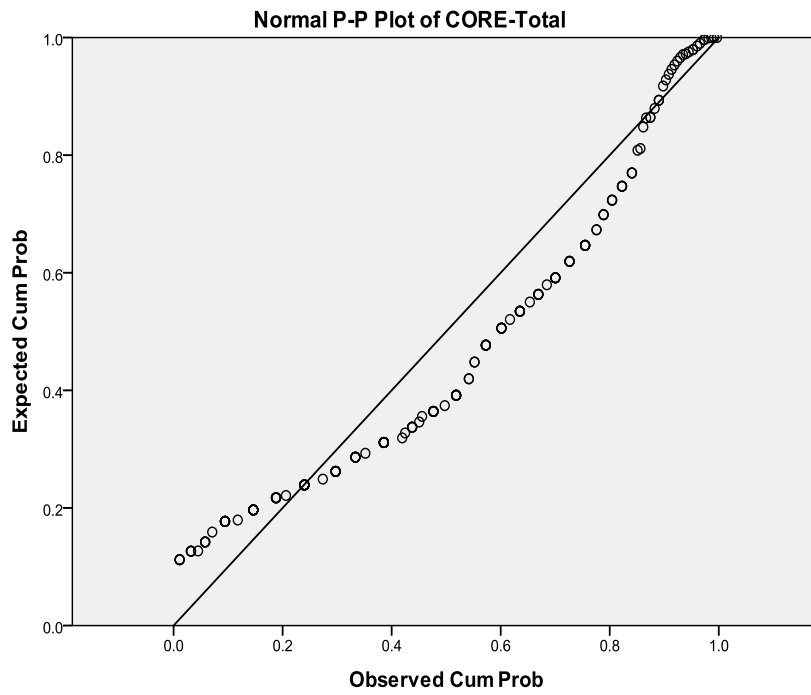












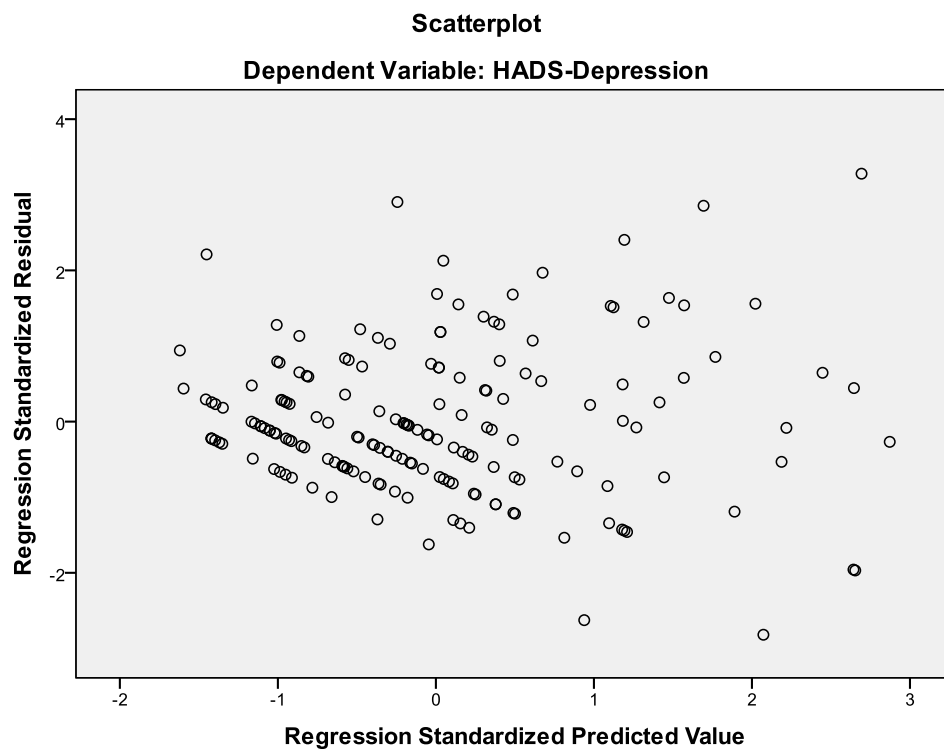
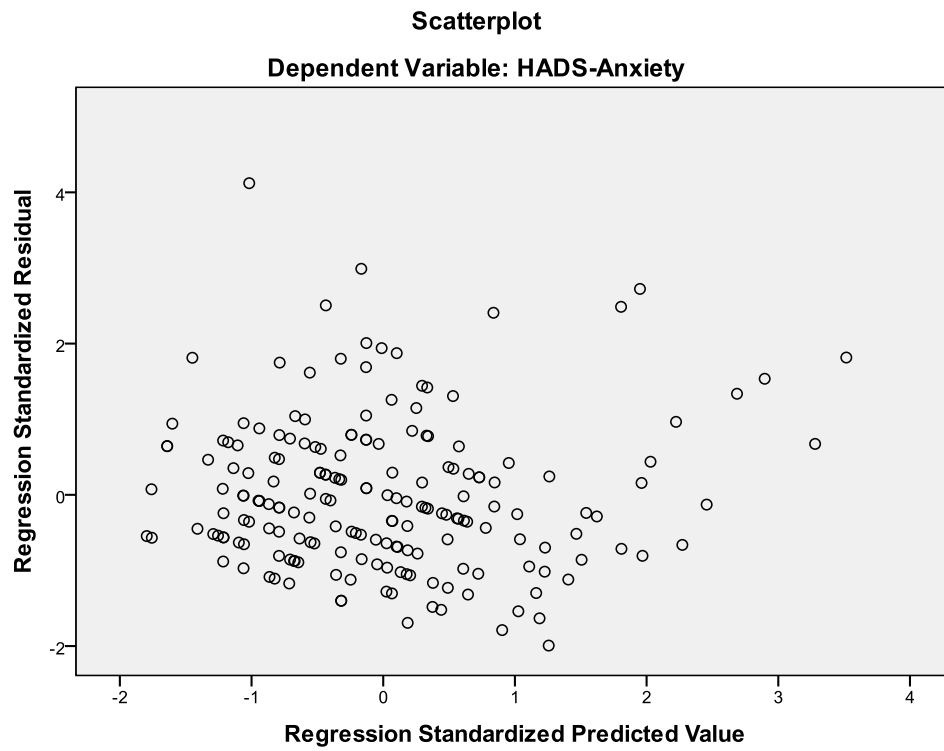
A6.3 Assessing homogeneity of variance – Results of Levene’s Test on outcome variables

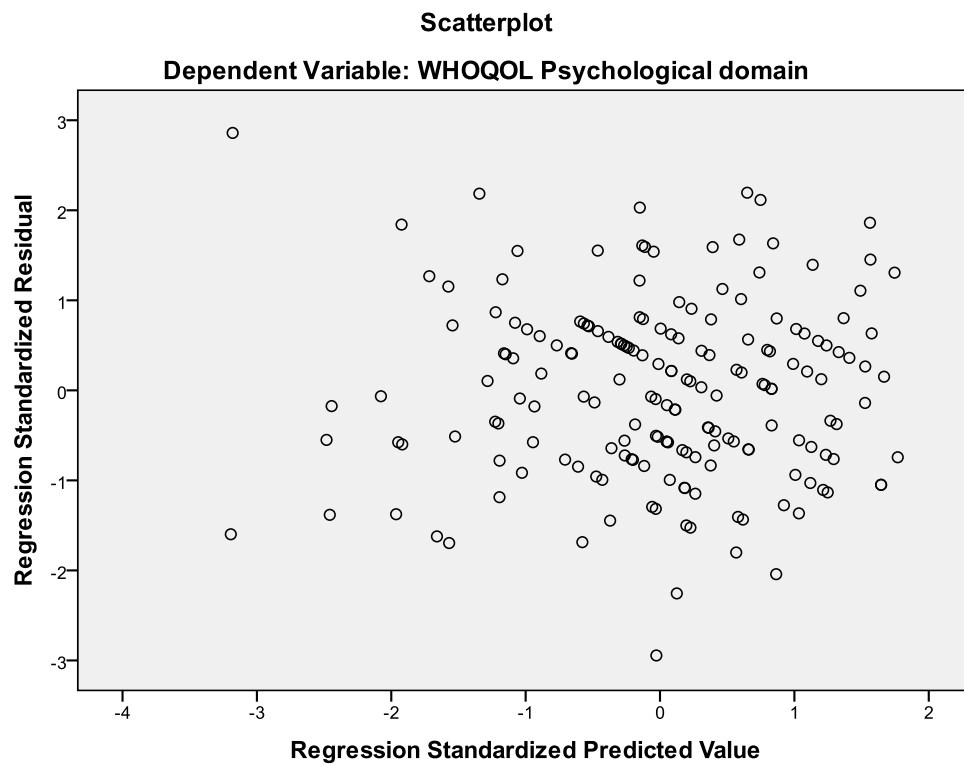
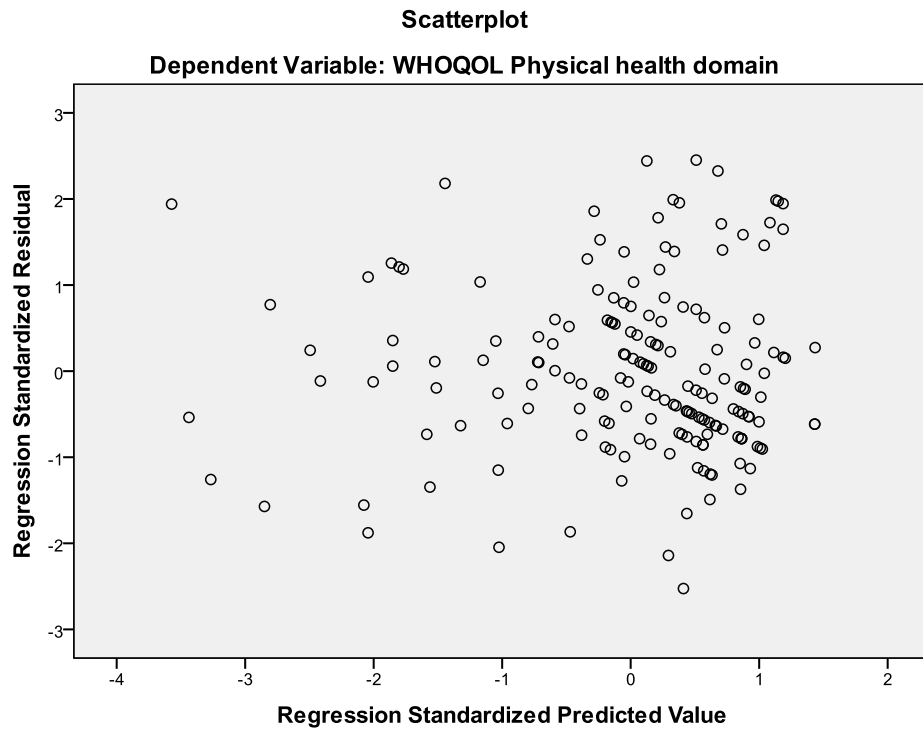
Measure/Sub-scale	Levene’s statistic
HADS-Anxiety	.128
HADS-Depression	.363
WHOQOL Physical health domain	5.213*
WHOQOL Psychological domain	.147
WHOQOL Social relationships domain	.112
WHOQOL Environmental domain	.578
CORE-Total	4.164*

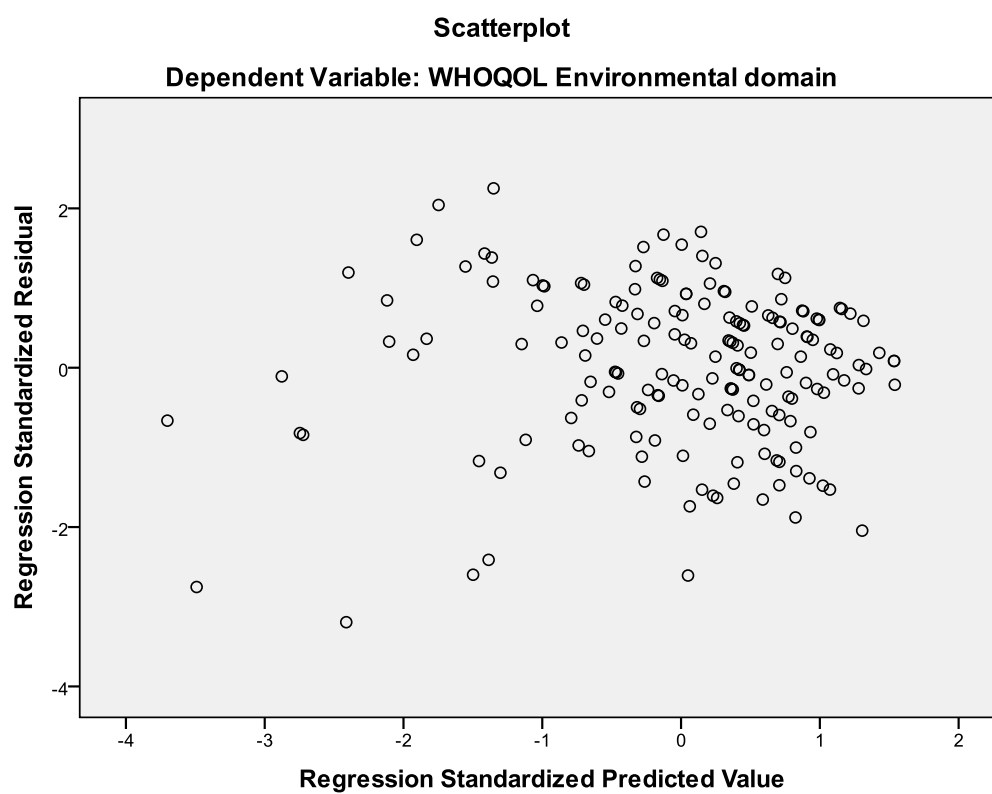
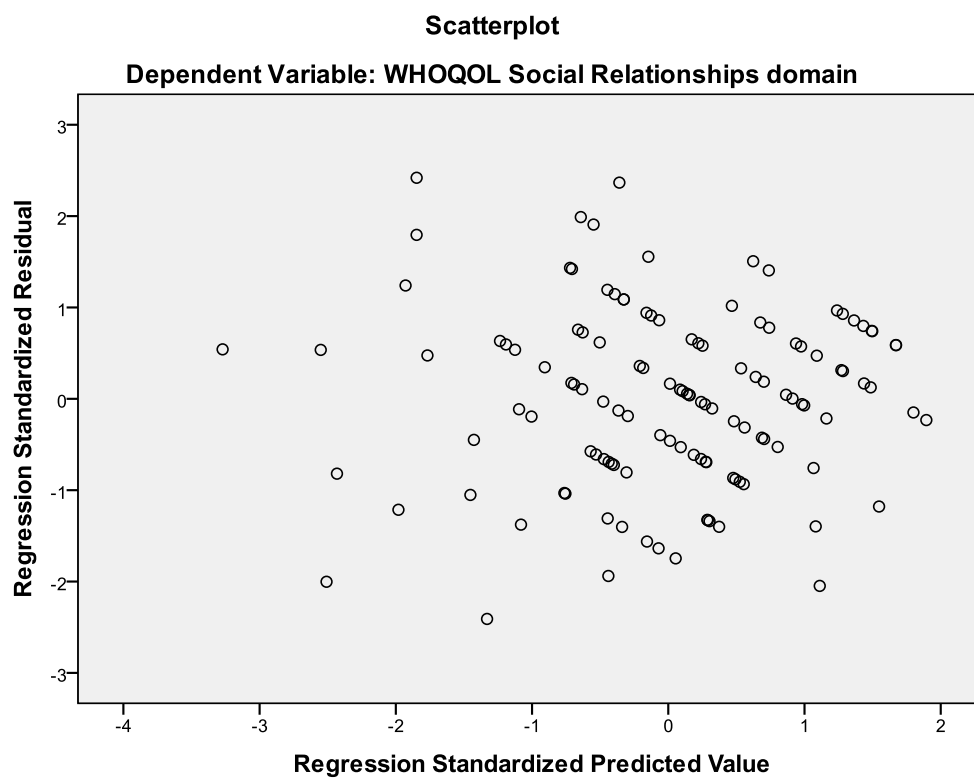
* $p < .05$

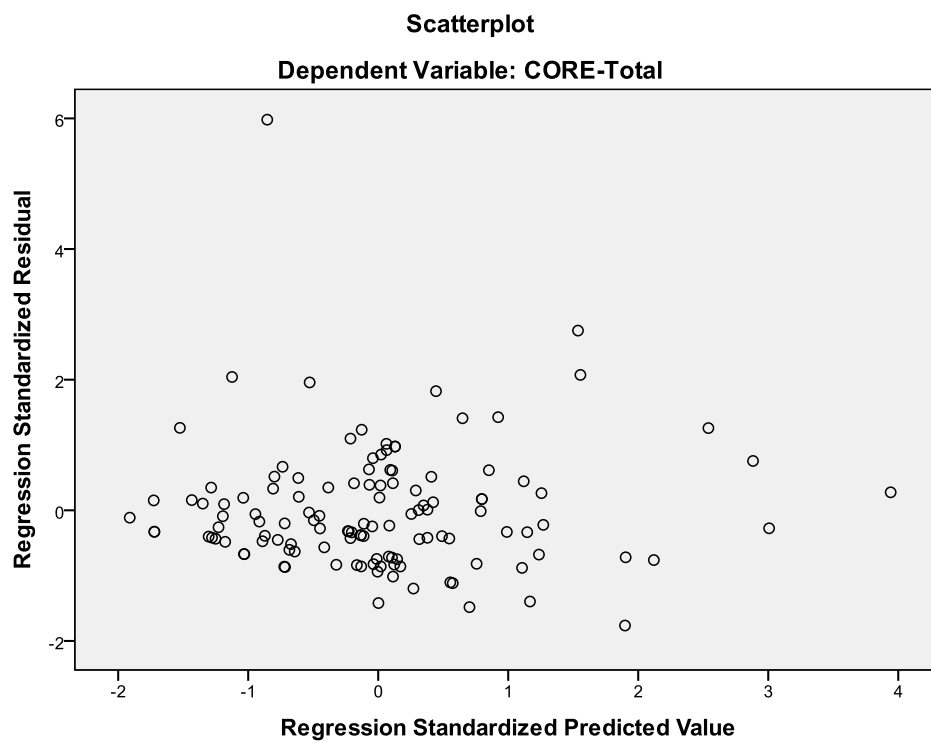
Appendix 7

A7.1 Assessing homoscedasticity and linearity

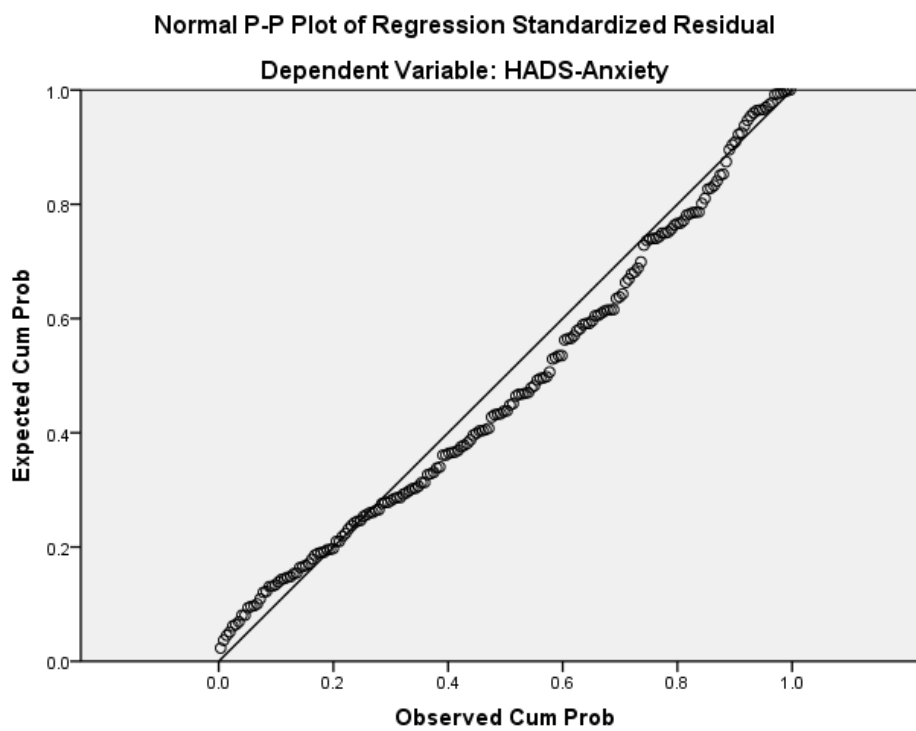
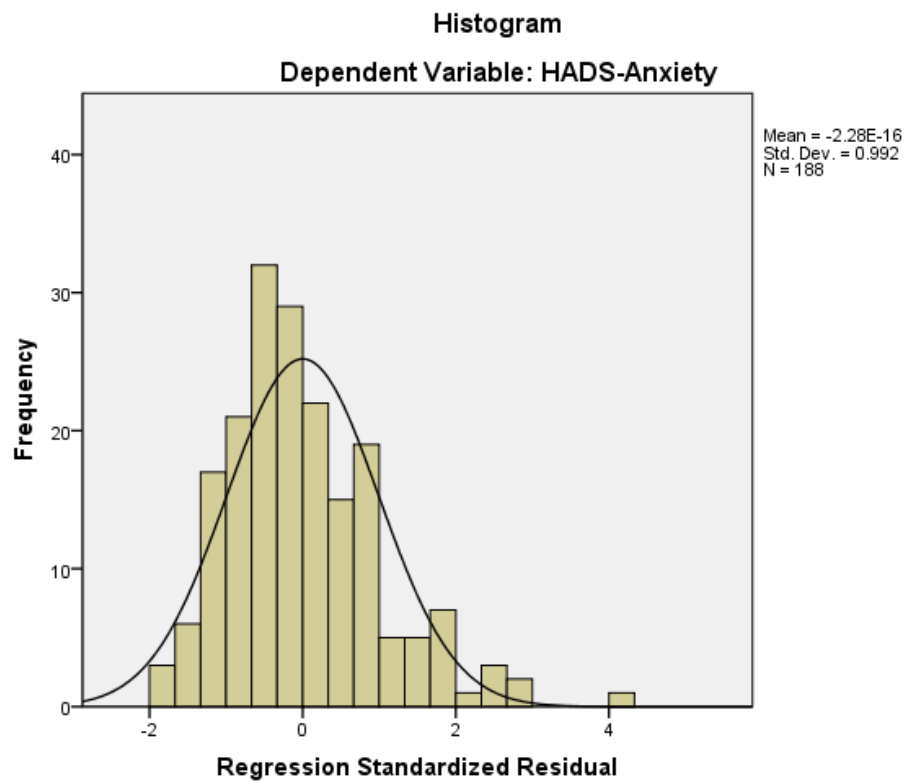


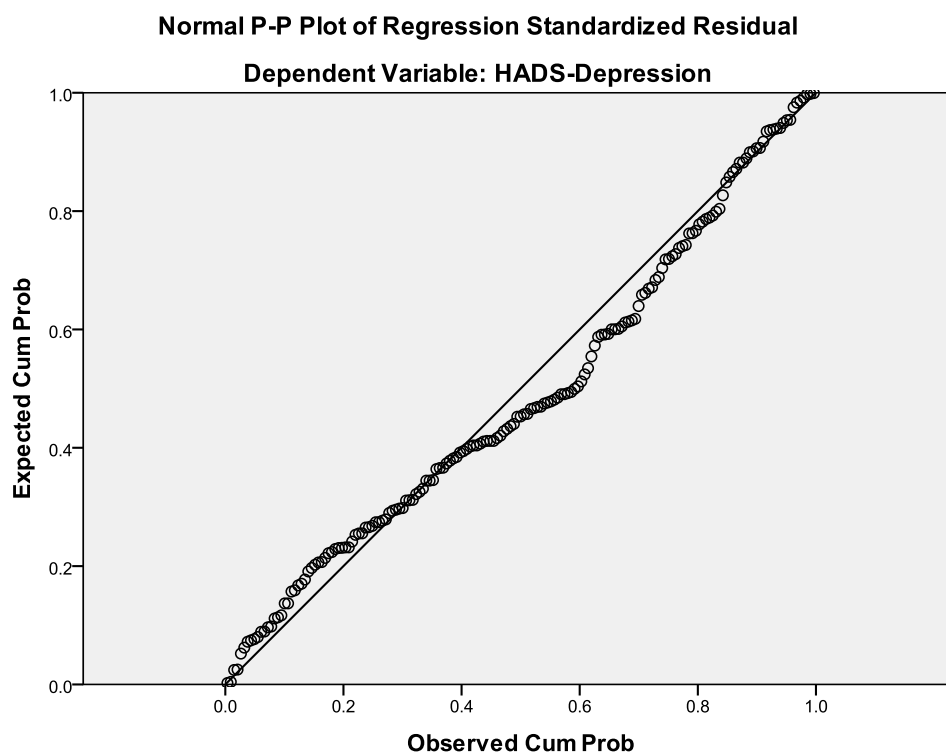
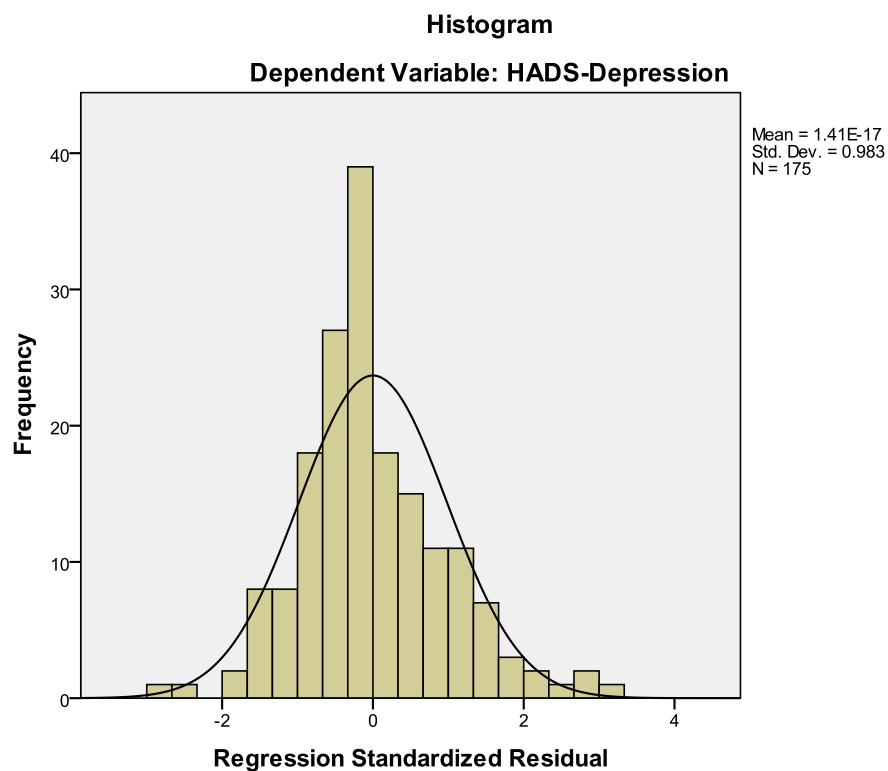


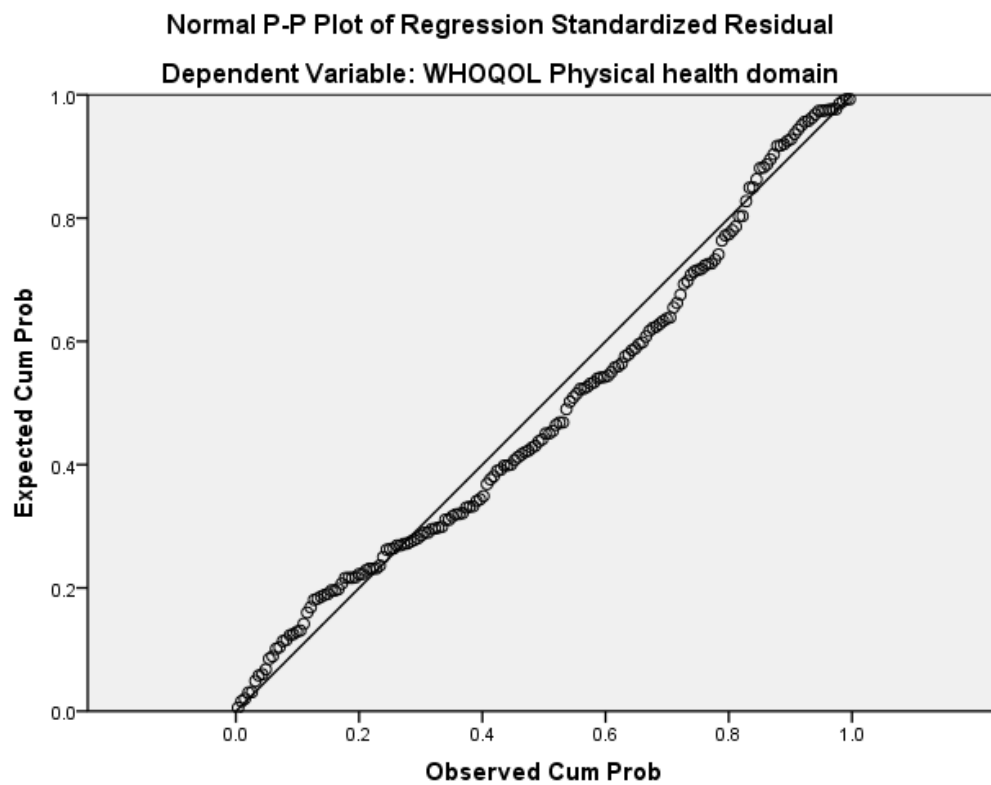
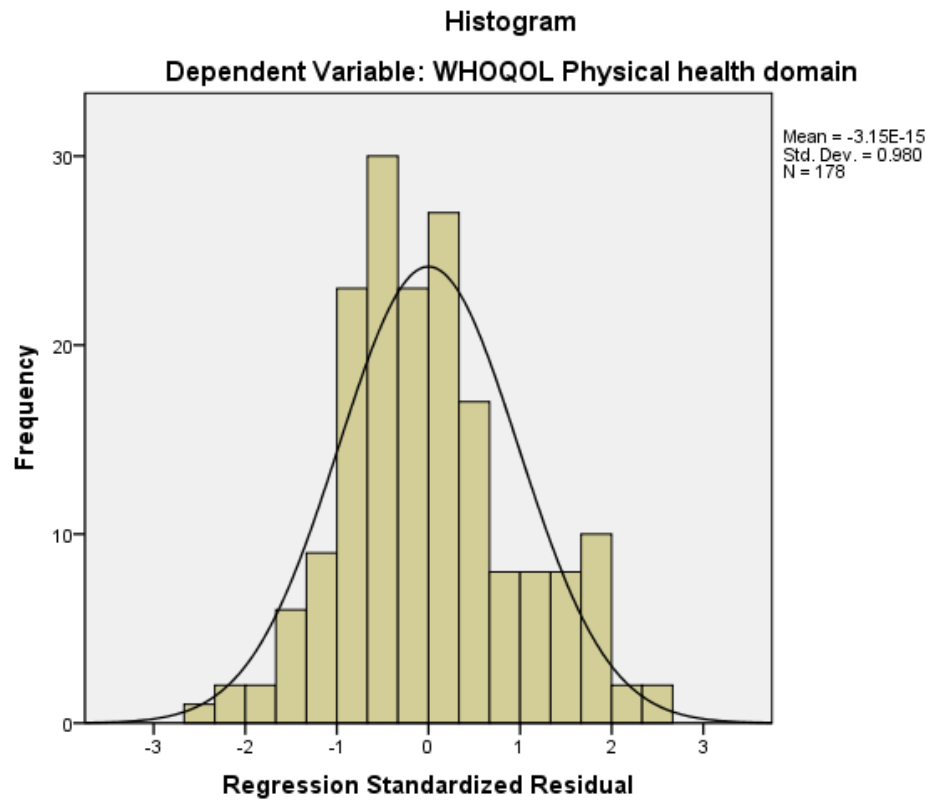


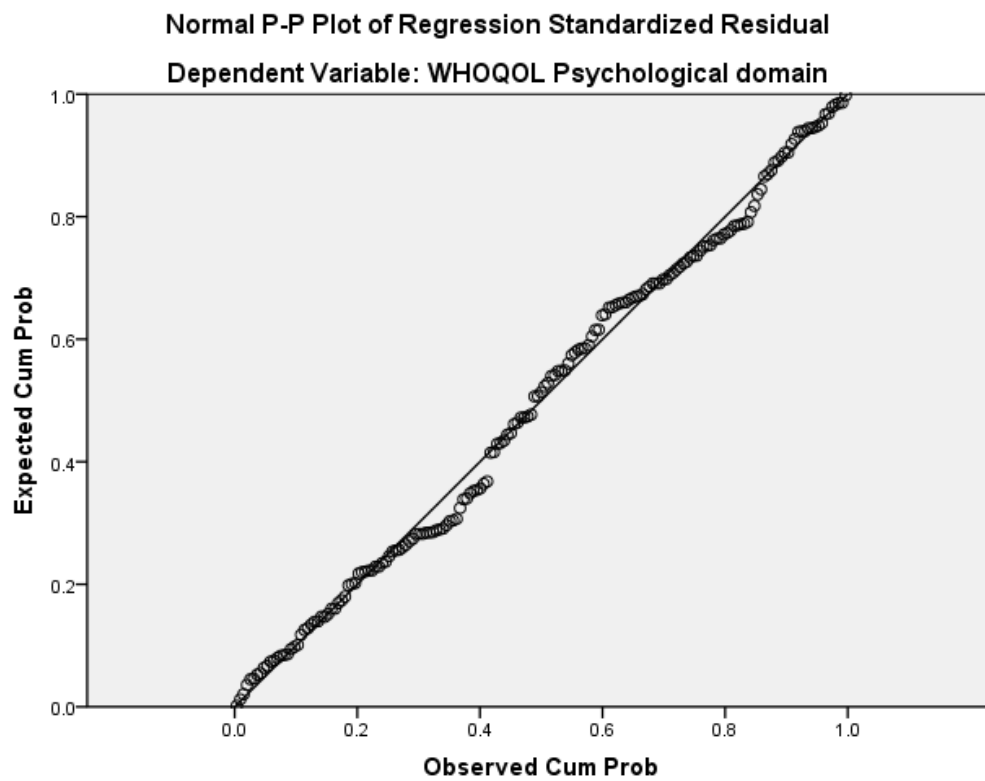
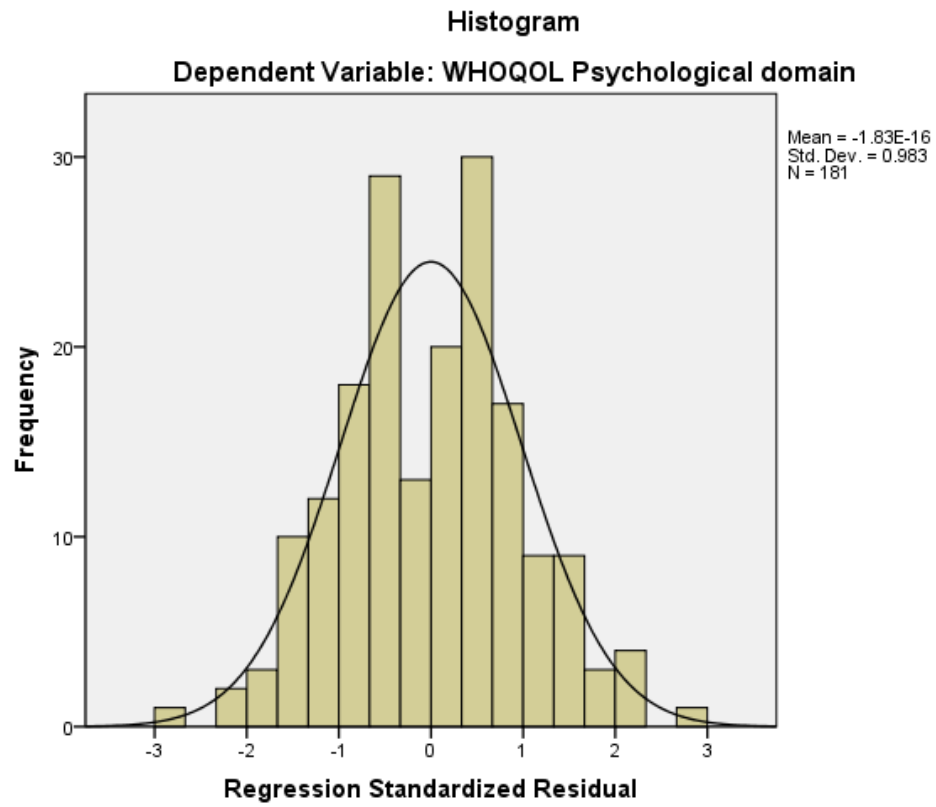


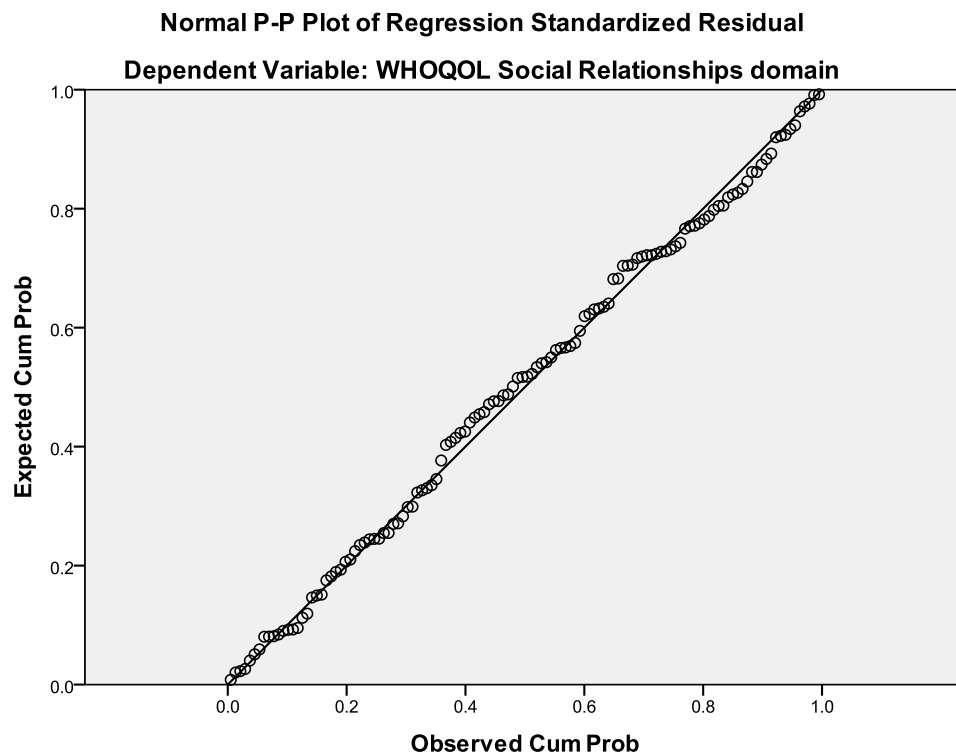
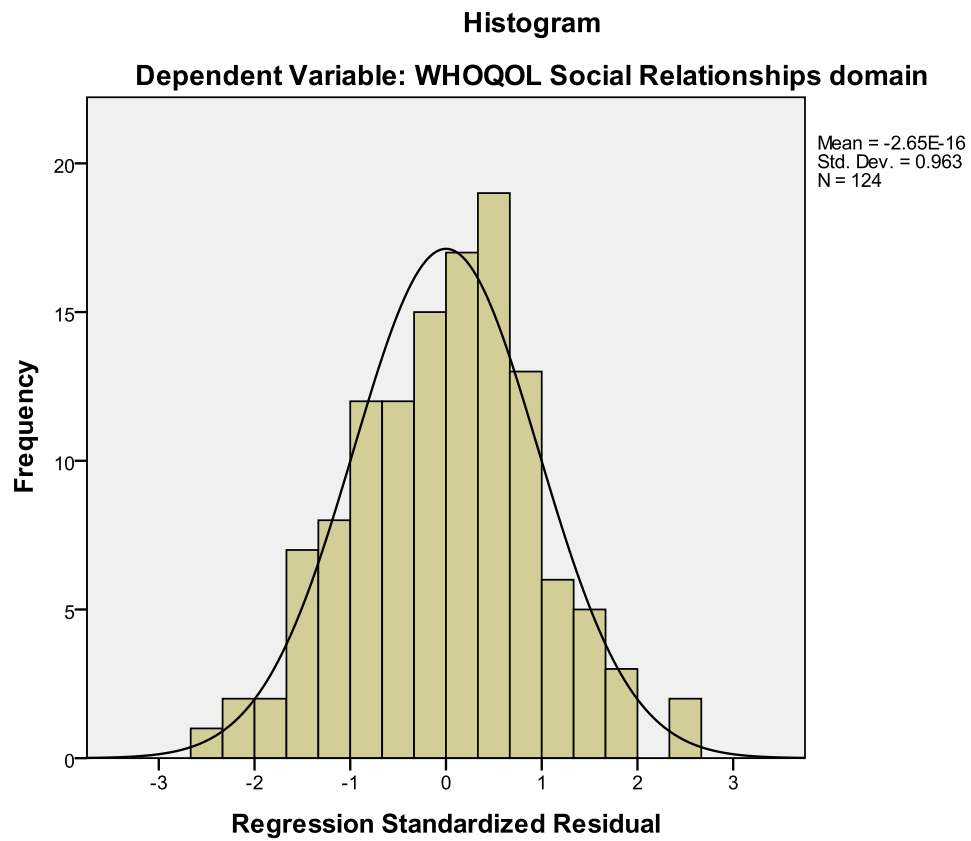
A7.2 Assessing the assumption of normally distributed errors

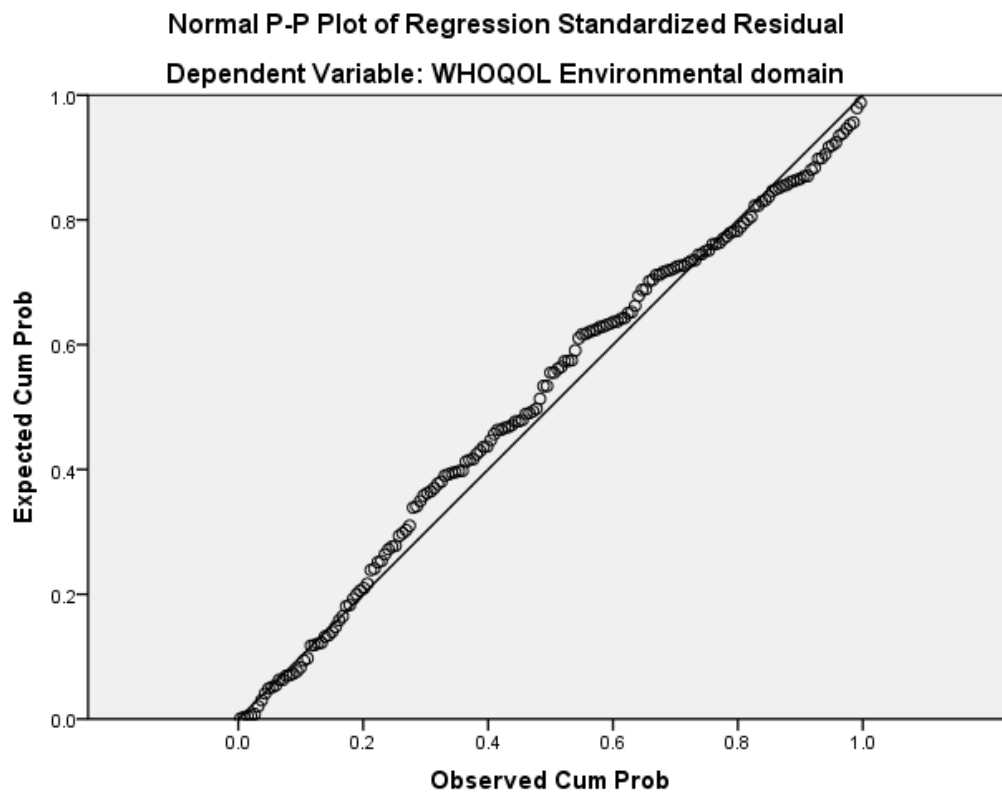
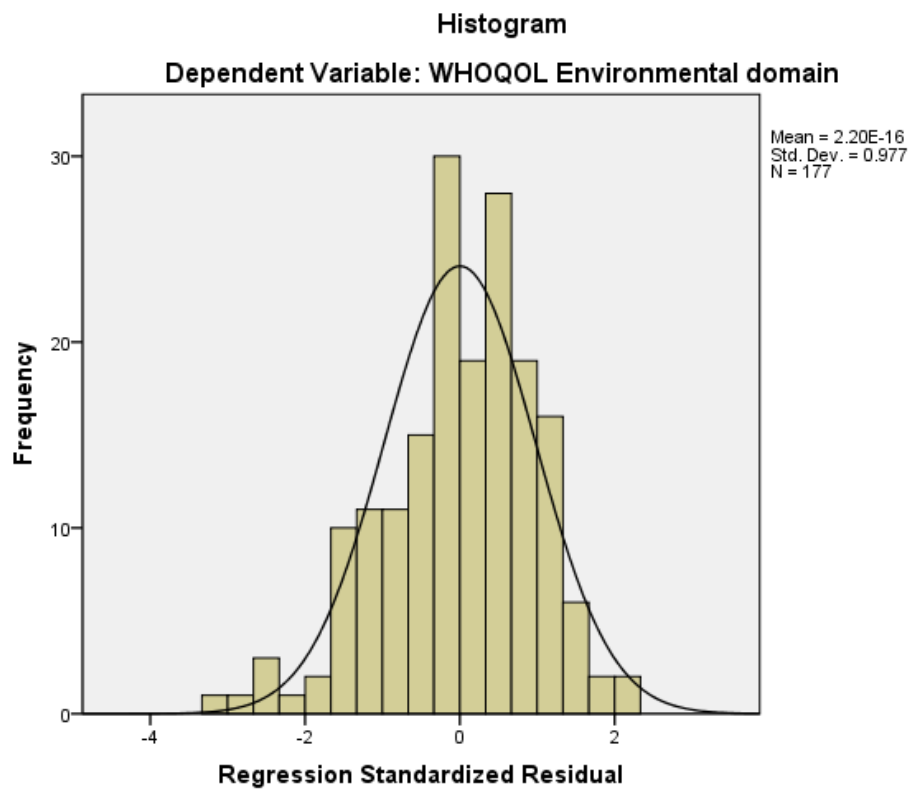


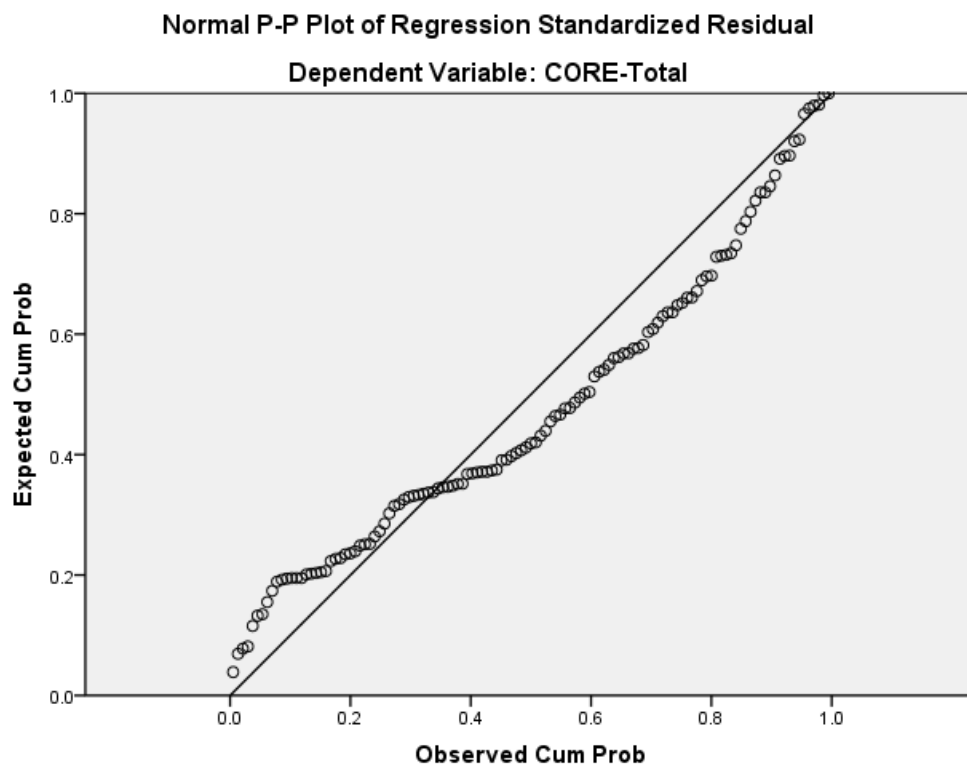
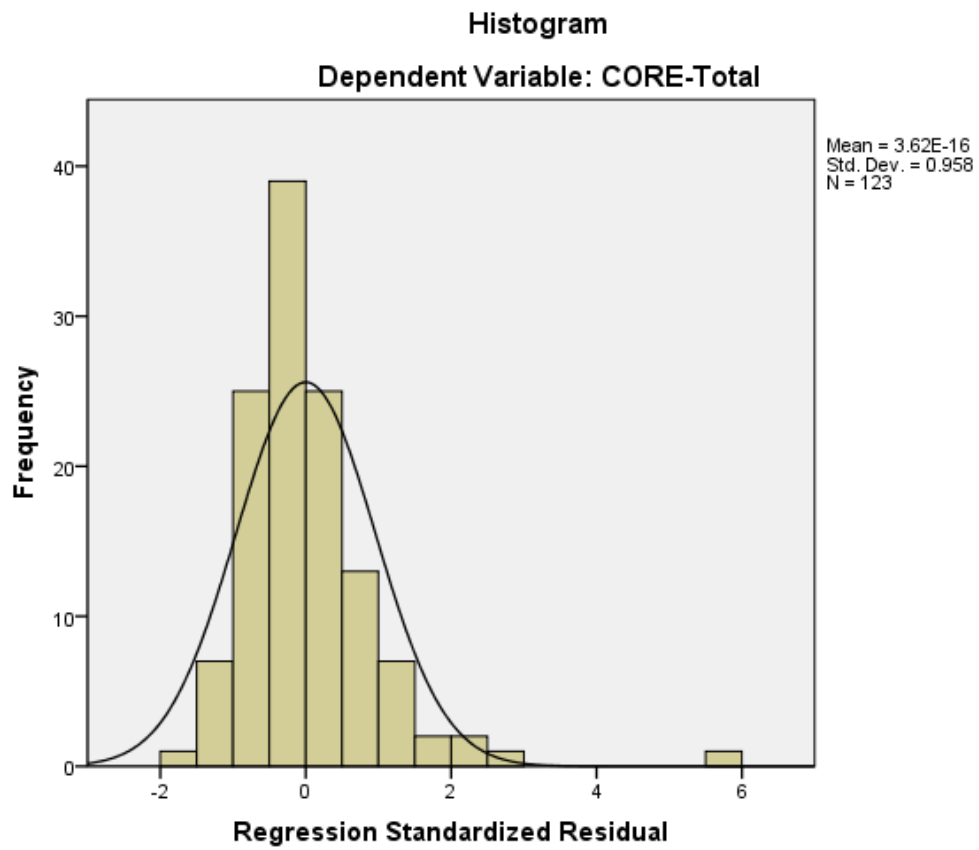












Appendix 8

A8.1 Pearson correlations coefficients (*r*) for primary outcome measures

		HADS- Anxiety	HADS- Depression	WHOQOL Physical health domain	WHOQOL Psychological domain	WHOQOL Social Relationships domain	WHOQOL Environmental domain	CORE- Total
HADS-Anxiety	<i>r</i>	1	.509**	-.349**	-.464**	-.262**	-.468**	.687**
	<i>n</i>	194	194	193	193	192	193	192
HADS-Depression	<i>r</i>	.509**	1	-.516**	-.602**	-.499**	-.542**	.647**
	<i>n</i>	194	196	194	194	193	194	192
WHOQOL Physical health domain	<i>r</i>	-.349**	-.516**	1	.601**	.329**	.554**	-.476**
	<i>n</i>	193	194	194	194	193	194	191
WHOQOL Psychological domain	<i>r</i>	-.464**	-.602**	.601**	1	.579**	.583**	-.655**
	<i>n</i>	193	194	194	194	193	194	191
WHOQOL Social Relationships domain	<i>r</i>	-.262**	-.499**	.329**	.579**	1	.490**	-.475**
	<i>n</i>	192	193	193	193	193	193	190
WHOQOL Environmental domain	<i>r</i>	-.468**	-.542**	.554**	.583**	.490**	1	-.642**
	<i>n</i>	193	194	194	194	193	194	191
CORE-Total	<i>r</i>	.687**	.647**	-.476**	-.655**	-.475**	-.642**	1
	<i>n</i>	192	192	191	191	190	191	192

** . Correlation is significant at the .01 level.

